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- 32X Max CD-ROM Drive[2]
- Compaq 56K V.90 Modem[3]
- Creative Labs SBS 2-piece Speakers
- nVIDIA TNTv 16MB Graphics
- Microsoft Windows 98
- Microsoft Office 2000 Small Business
- Free[4] Trial of Compaq Online Services
- 3-year Limited Warranty[5]

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- 24X Max CD-ROM Drive[2]
- Compaq V.90 Data/Fax Modem[6]
- Compaq PremierSound
- Integrated AC Adapter; 1 Li-Ion Battery
- Microsoft Windows 98
- Microsoft Office 2000 Small Business
- Free[4] Trial of Compaq Online Services
- 3-year Limited Warranty[5]

$2799*
Lease for: $94/month[7]

Customize with these options:

- Microsoft Office 2000 Professional Upgrade: $199
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- Compaq Global Case: $89

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- 14.1" CTFT (1024 x 768) Display
- 24X Max CD-ROM Drive[2]
- Compaq V.90 Data/Fax Modem[6]
- Compaq PremierSound
- Integrated AC Adapter; 1 Li-Ion Battery
- Microsoft Windows 98
- Microsoft Office 2000 Small Business
- Free[4] Trial of Compaq Online Services
- 3-year Limited Warranty[5]

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- 24X Max CD-ROM Drive[2]
- Compaq V.90 Data/Fax Modem[6]
- Compaq PremierSound
- Integrated AC Adapter; 1 Li-Ion Battery
- Microsoft Windows 98
- Microsoft Office 2000 Small Business
- Free[4] Trial of Compaq Online Services
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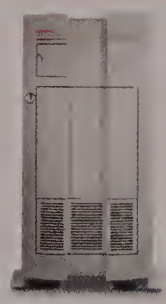

PROSIGNIA DESKTOP 330

- Intel Pentium III Processor 450 MHz
- 9.1GB Ultra ATA Hard Drive[1]
- 64MB SDRAM (expandable to 384MB)
- S700 17" Monitor (15.7" viewable)
- 32X Max CD-ROM Drive[2]
- Compaq 56K V.90 Modem[3]
- Creative Labs SBS 2-piece Speakers
- nVIDIA TNTv 16MB Graphics
- Microsoft Windows 98
- Microsoft Office 2000 Small Business
- Free[4] Trial of Compaq Online Services
- 3-year Limited Warranty[5]

$1589*
Lease for: $53/month[7]

Customize with these options:

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- Upgrade to S900 19" Monitor (18" viewable): $200
- Upgrade to Microsoft Office 2000 Professional: $199

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- 64MB 100 MHz SDRAM (expandable to 1GB)
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- Max Internal Storage of 72.8GB[1]
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- 32X Max CD-ROM Drive[2]
- 10/100 TX UTP NIC
- 6 Slots (2 PCI, 4 PCI/ISA)
- Server Management Software
- Pre-Failure Warranty[5]: Processor, Memory, Hard Drive
- 3-year Limited Warranty[5]

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Introducing the BJC-6000 Color Bubble Jet™ printer.

A few seconds is all you need. After all, print speeds up to 8 ppm in black and 5 ppm in color make it one of the fastest printers in its class. And with 1440 x 720 dpi as well as our exclusive Drop Modulation Technology,™ the color is certainly something to talk about. Plus, our exclusive Canon Think Tank System™ features money-saving individual ink tanks. The BJC-6000. For about $199* (after $50 mail-in rebate), it's simply the smart choice. Visit our Web site at www.ccsi.canon.com/6000 or call 1-800-OK-CANON for details.

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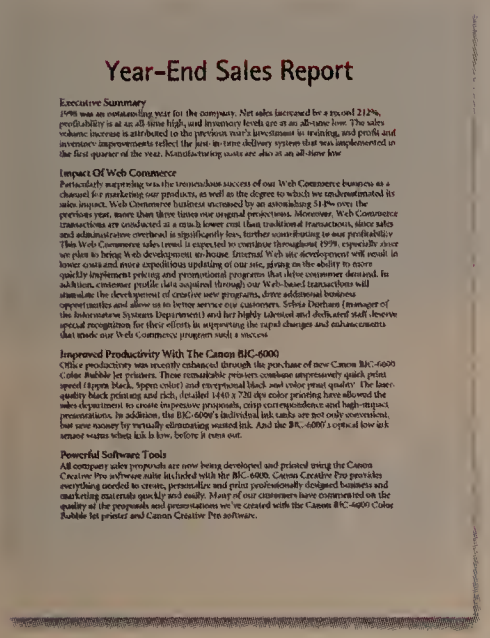

Year-End Sales Report

Executive Summary

1998 was an outstanding year for the company. Net sales increased by a record 212%, profitability is at an all-time high, and inventory levels are at an all-time low. The sales volume increase is attributed to the previous year's investment in training, and profit and inventory improvements reflect the just-in-time delivery system that was implemented in the first quarter of the year. Manufacturing costs are also at an all-time low

Impact Of Web Commerce

Particularly surprising was the tremendous success of our Web Commerce business as a channel for marketing our products, as well as the degree to which we simultaneously its sales impact. Web Commerce business increased by an astonishing 514% over the previous year, more than three times our original projections. Moreover, Web Commerce transactions are conducted at a much lower cost than traditional transactions, since sales and administrative overhead is significantly less, further contributing to our profitability. This Web Commerce sales trend is expected to continue throughout 1999, especially since we plan to bring Web development in-house. Internal Web site development will result in lower costs and more expeditious updating of our site, giving us the ability to more quickly implement pricing and promotional programs that drive customer demand. In addition, customer profile data acquired through our Web-based transactions will stimulate the development of creative new programs, drive additional business opportunities and allow us to better service our customers. Sylvia Durham (manager of the Information Systems Department) and her highly talented and dedicated staff deserve special recognition for their efforts in supporting the rapid changes and enhancements that made our Web Commerce program such a success

Improved Productivity With The Canon BJC-6000

Office productivity was recently enhanced through the purchase of new Canon BJC-6000 Color Bubble Jet printers. These remarkable printers combine impressively quick print speed (8ppm black, 5ppm color) and exceptional black and color print quality. The laser-quality black printing and rich, detailed 1440 x 720 dpi color printing have allowed the sales department to create impressive proposals, crisp correspondence and high-impact presentations. In addition, the BJC-6000's individual ink tanks are not only convenient, but save money by virtually eliminating wasted ink. And the BJC-6000's optical low ink sensor warns when ink is low, before it runs out.

Powerful Software Tools

All company sales proposals are now being developed and printed using the Canon Creative Pro software suite included with the BJC-6000. Canon Creative Pro provides everything needed to create, personalize and print professionally designed business and marketing materials quickly and easily. Many of our customers have commented on the quality of the proposals and presentations we've created with the Canon BJC-6000 Color Bubble Jet printer and Canon Creative Pro software.

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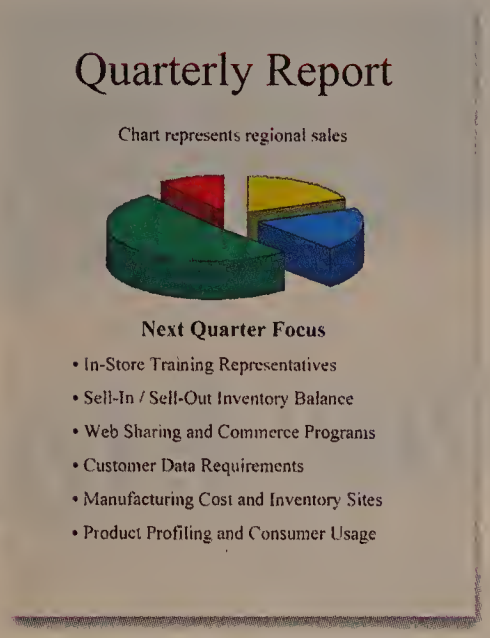

Quarterly Report

Chart represents regional sales

Next Quarter Focus

- In-Store Training Representatives
- Sell-In / Sell-Out Inventory Balance
- Web Sharing and Commerce Programs
- Customer Data Requirements
- Manufacturing Cost and Inventory Sites
- Product Profiling and Consumer Usage

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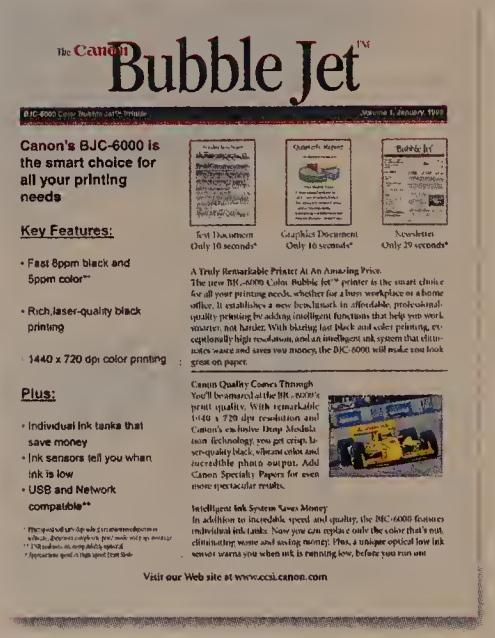

The Canon Bubble Jet™

BJC-6000 Color Bubble Jet™ Printer — Volume 1, January 1999

Canon's BJC-6000 is the smart choice for all your printing needs

Key Features:

- Fast 8ppm black and 5ppm color**
- Rich, laser-quality black printing
- 1440 x 720 dpi color printing

Plus:

- Individual ink tanks that save money
- Ink sensors tell you when ink is low
- USB and Network compatible**

Text Document Only 10 seconds*

Graphics Document Only 16 seconds*

Newsletter Only 29 seconds*

A Truly Remarkable Printer At An Amazing Price

The new BJC-6000 Color Bubble Jet™ printer is the smart choice for all your printing needs, whether for a busy workplace or a home office. It establishes a new benchmark in affordable, professional-quality printing by adding intelligent functions that help you work smarter, not harder. With blazing fast black and color printing, exceptionally high resolution, and an intelligent ink system that eliminates waste and saves you money, the BJC-6000 will make you look great on paper.

Canon Quality Comes Through

You'll be amazed at the BJC-6000's print quality. With remarkable 1440 x 720 dpi resolution and Canon's exclusive Drop Modulation technology, you get crisp, laser-quality black, vibrant colors and incredible photo output. Add Canon Specialty Papers for even more spectacular results.

Intelligent Ink System Saves Money

In addition to incredible speed and quality, the BJC-6000 features individual ink tanks. Now you can replace only the color that's out, eliminating waste and saving money. Plus, a unique optical low ink sensor warns you when ink is running low, before you run out.

Visit our Web site at www.ccsi.canon.com

Key Features

- *Fast print speeds up to 8 ppm black & 5 ppm color*
- *Rich, laser-quality black printing*
- *1440 x 720 dpi color & black printing*
- *Large individual ink tanks save you money*

$199* *after $50 mail-in rebate.*

CANON think tank SYSTEM™

Save money with Canon's Individual Ink Tanks.

It's an innovation designed to save money and eliminate ink waste. The Canon Think Tank System™ has separate tanks for each ink color, allowing you to replace only the colors that run out. And optical ink sensors automatically monitor ink levels, giving you an on-screen warning when a color is low.

Canon

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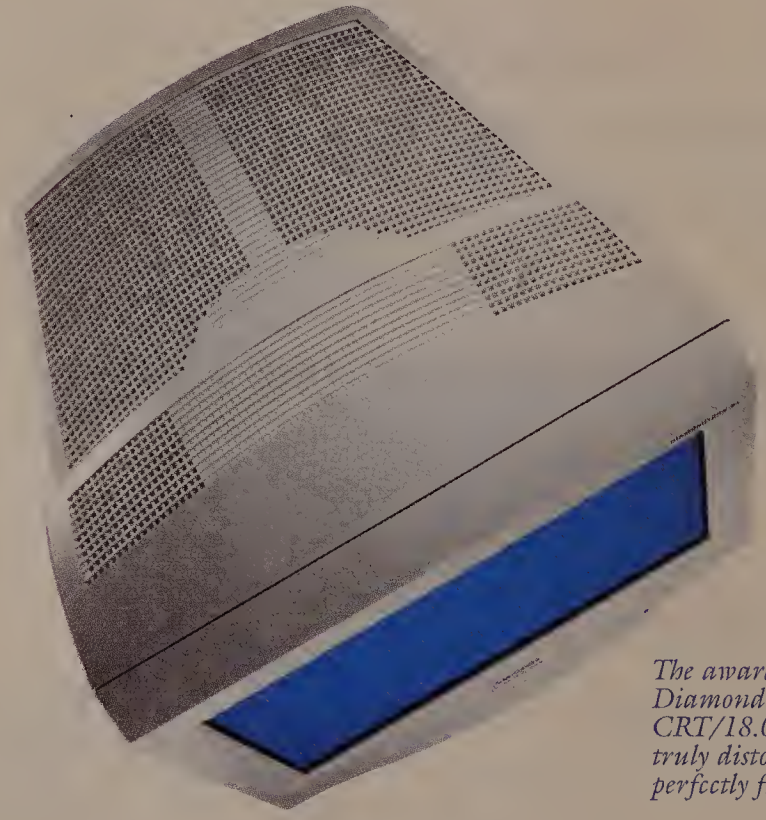
Has Your Monitor Been



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Diamond Pro 900u July 1999	Diamond Pro 2020u June 1999	Diamond Pro 2020u June 1999	Diamond Pro 900u Jan. 19, 1999 Best 19" upgrade March 9, 1999	Diamond Pro 900u March 1999	Diamond Pro 900u February 1999

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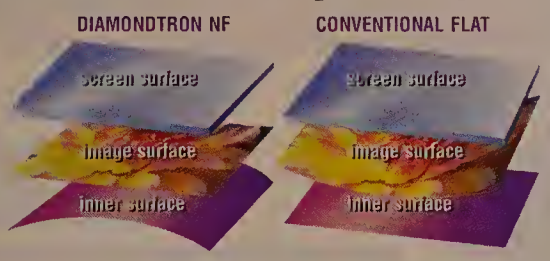
If you're using a conventional CRT monitor, your eyes and brain are working overtime to correct for the curvature. Now, however, with its DIAMONDTRON NF™ (Natural Flat) family, Mitsubishi has completely revolutionized monitor technology. With a perfectly flat screen from edge to edge and truly distortion-free imagery, you'll experience an unprecedented improvement in viewing pleasure. Not to mention the dazzling brightness, razor-sharp clarity and stunning color accuracy which puts Mitsubishi in a class by itself. With no curvature, reflections and glare are also eliminated. The result is remarkably realistic, natural-looking flat images. Your energy can now be spent being more creative and more productive. For added versatility, DIAMONDTRON NF monitors feature a unique self-powered USB hub which allows you to switch all connected USB peripherals between two computers automatically. With DIAMONDTRON NF monitors, Mitsubishi will forever change your view of the world. The difference is right before your eyes. For more information on the award-winning Diamond Pro 900u (19-inch CRT/18.0-inch DVI*) and new Diamond Pro 2020u (22-inch CRT/20-inch DVI*) models, contact Mitsubishi Electronics today.

DIAMONDTRON NF™



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PC WORLD

AUGUST

VOLUME 17 ◆ NUMBER 8

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Is your PC slow to start on cold mornings? Does it creak and groan going up steep 3D hills? Let our comprehensive guide help you take control of your hardware *and* software and get the most out of your system.

124 **Troubleshooting Is My Business**

152 **The Fix Is In: Top Windows Utilities**

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HOW TO No matter what hardware malady ails your PC—from a chattering modem to a balky graphics card—Dr. Kirk (aka Kirk Steers of *PC World*'s *Hardware Tips*) has his tongue depressor and reflex hammer ready. He knows the symptoms, and he'll tell you how to cure the problem. Plus, five checklists for performing surgery on your PC's innards confidently.

152 **THE FIX IS IN: TOP WINDOWS UTILITIES**

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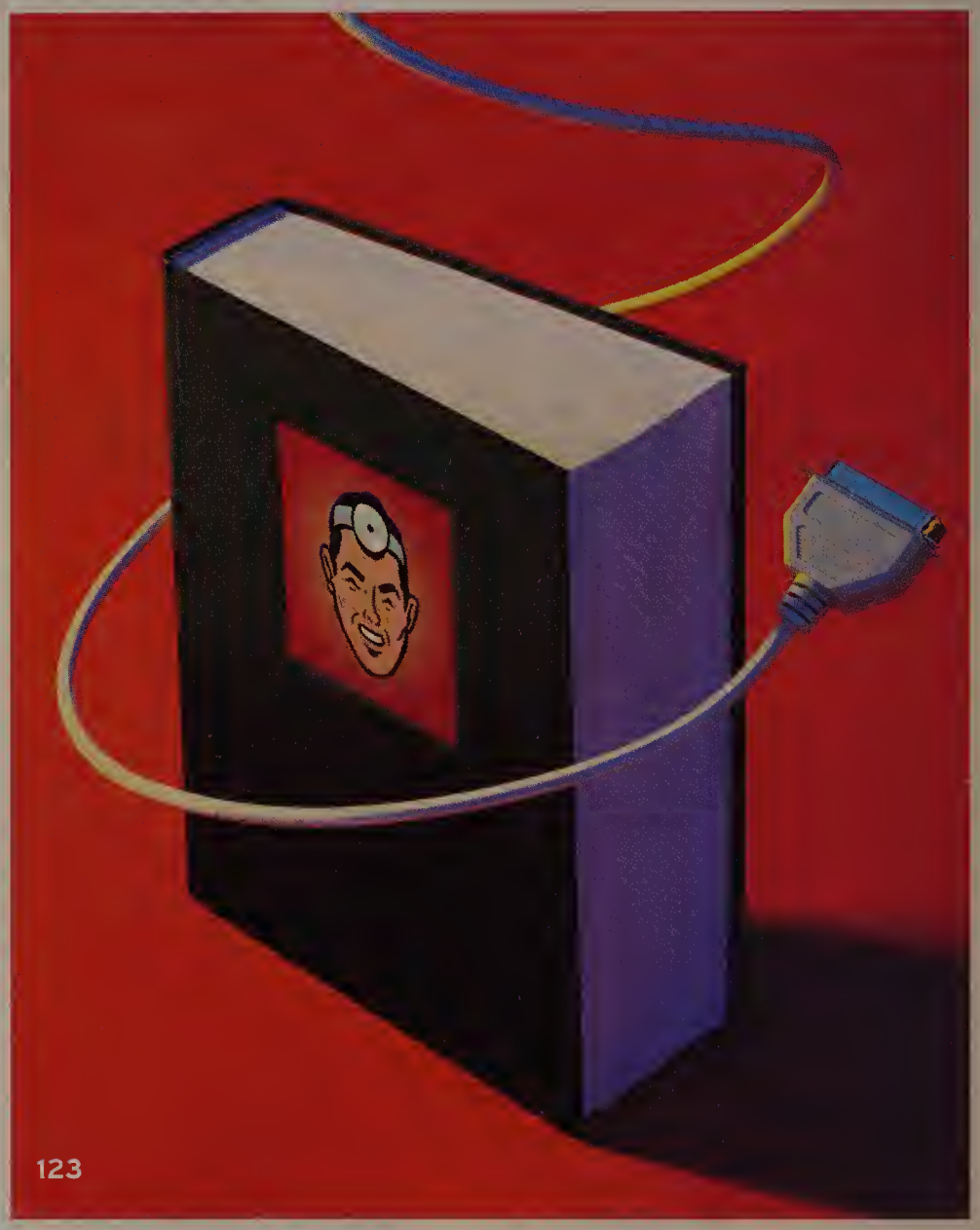
179 **LCD MONITORS: LIGHT, SLIGHT, AND STYLISH**

REVIEW A new generation of LCD monitors offers vibrant color and sharp contrast in a profile no thicker than a waffle iron. We put 19 of these desktop space savers through their paces and found two 15-inch Best Buys—and plenty to get excited about.



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Additional material available on PC World Online: www.pcworld.com

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THE SAVVY SHOPPER

195 **SOLD! HOW TO WIN AT WEB AUCTIONS**

Longing to dive into the online auction scene but afraid of getting soaked by unscrupulous operators? Want to navigate like an expert, avoiding snags and runarounds? We test the waters at seven major sites, risking disgrace, defeat, deception, and despair so you can nab the best deals.

COVER *Illustration by Mark Matcho*

ICONS: JEFFREY PELO

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106 Right Hemisphere Deep Paint; Castlewood Orb 2.2GB Portable Drive
110 Data Description Viz-on Excel add-in; Antec PhotoChute3 USB drive
112 MetaCreations Office Advantage graphics add-on; Interlink Electronics EPad electronic pen; Sony Spressa USB CRX100E/X CD-R/RW drive
114 SPOTLIGHT A luxuriant grove of Palm accessories

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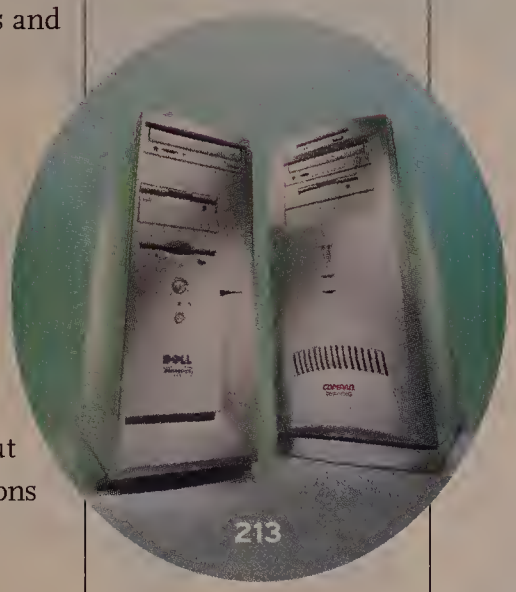

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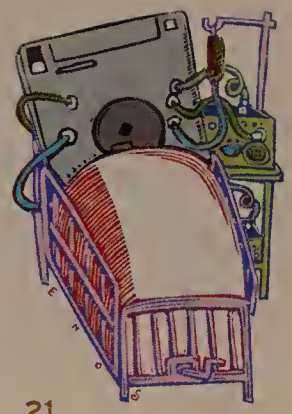

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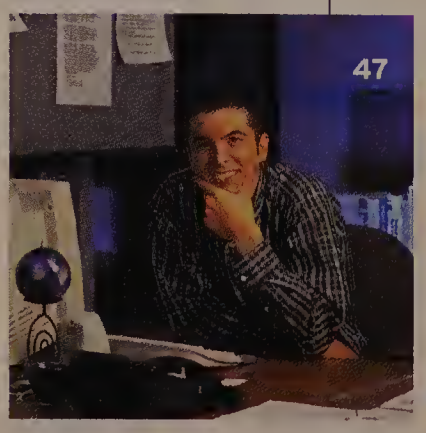

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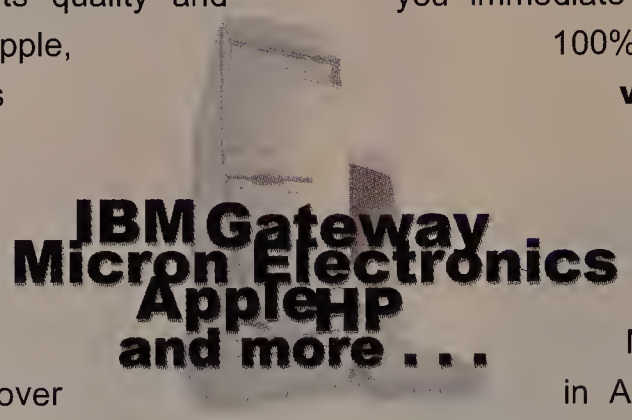

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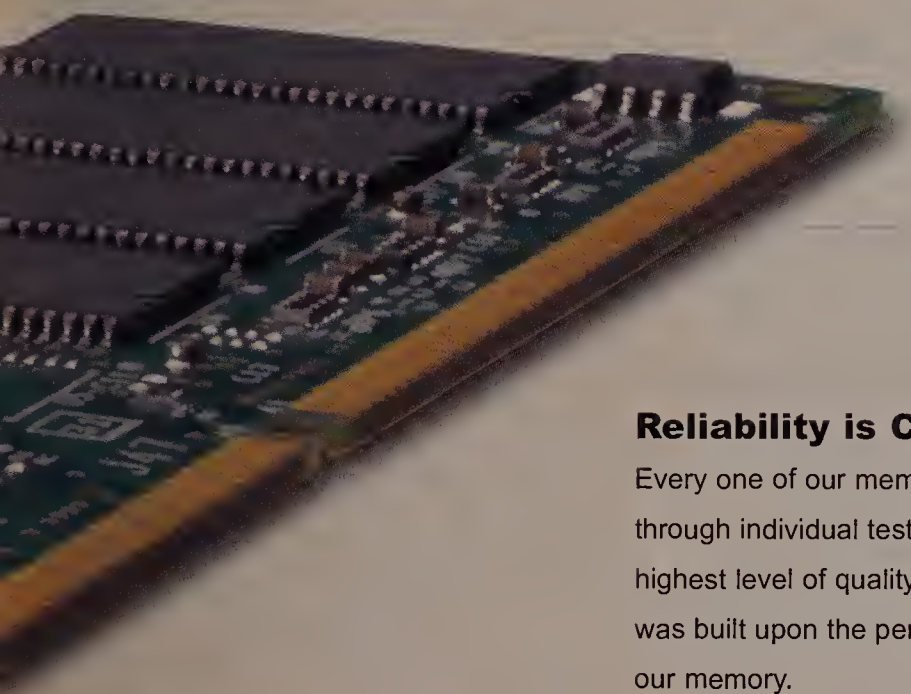

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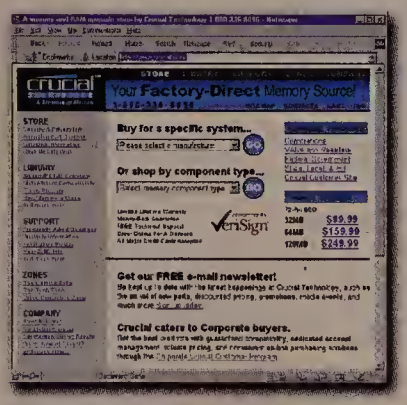

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AMD's K7: Better Than Intel's Best?

YOU'VE PROBABLY NEVER bought a PC with an AMD CPU. You may not be considering one now. All the same, you owe AMD your thanks. If you've bought a PC in the last two or three years, the number two chipmaker has saved you a lot of money. Not that AMD is trying to play the generous uncle. It's struggling to make a profit. And what a struggle it has been. AMD's K5, touted as a challenger to the Pentium, stumbled in the starting gate. AMD's K6 took a momentary lead over Intel's Pentium MMX. More recently, the K6-III-450 nosed in front of the Pentium III-450 and (on some benchmarks) the Pentium III-500, only to be quickly eclipsed by the Pentium III-550. Always the off-brand and usually the performance laggard, AMD has had to settle for a big chunk of the low end of the market. No doubt about it: Keeping up with a competitor is tough when you have to stay compatible as well.

If the K7 comes through, Intel will have to bring out the next generation of chips sooner than anyone expects.

Nevertheless, AMD's limited success against Intel shows what a little competition can do. The chip giant has been forced to cut prices across the board. Without AMD, there would be no Celeron—Intel rushed out its budget chip after AMD began capturing the low end of the market. Once a cacheless loser, Celeron soon became a winner in the battle for the bargain basement. With performance rivaling Pentium-IIIs for much lower prices, Celeron chips offer excellent value.

WILL AMD PULL ANOTHER AMD?

AMD'S K7 IS ARRIVING as you read this. If it bombs, PCs may never be such bargains again. On the other hand, if the K7 keeps AMD's promises, it may heighten competition and lead to price cuts not only in the budget sector but also at the top of the line. The industry is abuzz with speculation about the K7. Companies that have seldom sold AMD systems now fret about the possibility of competing with the K7, which may substantially outperform anything in Intel's arsenal for the next several months.

Companies gearing up to sell K7 systems are fretting, too. They think the K7 will be a big winner if AMD can make it in sufficient volume at the highest clock speeds. But many of these companies fear AMD will do what one PC executive calls "pulling an AMD." That phrase—which means falling short of promises with regard to delivery date, performance, volume, or all three—says a lot about AMD's history.

AMD certainly can spec processors with the best of them. The K7 is promised to run at 600 MHz when made with AMD's current 0.25-micron process. Later this year, the company's move to a 0.18-micron process will shrink the K7 and make higher speeds possible. Nothing less than 1-GHz K7s are due in the year 2000.

AMD's processors have always done well in integer performance, which is important for common business tasks, but have lagged in floating-point performance, which counts most in elaborate financial models, engineering, and games. The K7 claims superior integer performance and even better floating point, with three floating-point units on board to the Pentium III's two. In addition, the K7 is loaded with multimedia instructions. Gamers take note: AMD promises that optimized drivers will be available at launch from NVidia, 3dfx, and Matrox, with S3 and ATI drivers coming soon.

When the K7's on-chip 128KB L1 cache becomes too small, the K7 will call on the 200-MHz EV6 bus developed for Digital's Alpha processors. Unlike the Pentium III, the EV6 bus has a "source-synchronous" design. If fast enough memory can be had, the EV6 bus will give the K7 a big edge over the Pentium III—Intel's current top bus speed is 100 MHz.

BRING IN THE RESERVES

BESIDES THE DOUBTS about AMD's ability to deliver on time, achieve claimed performance levels, and manufacture in volume, there's the matter of Intel's back room. Each time AMD has challenged at the high end, Intel has quickly introduced a powerful answer. It almost seems as though Intel saves its top performers to trump AMD's product introductions. But if the K7 comes through, Intel will have to bring out the next generation of chips sooner than anyone expects.

Though we evaluate products impartially, we can't help pulling for AMD to succeed in introducing the K7 as promised. Since National Semiconductor/Cyrix abandoned the race for performance leadership, AMD is the last hope for keeping competitive pressure on Intel. Lesser challengers than the K7 brought the wave of price reductions in low-end PCs. If the K7 does the same for the high end, consumers and businesses will reap great rewards. If AMD can't compete, on the other hand, you'd better start budgeting more for your next PC.

Phil Lemmons is editorial director of PC World. ■

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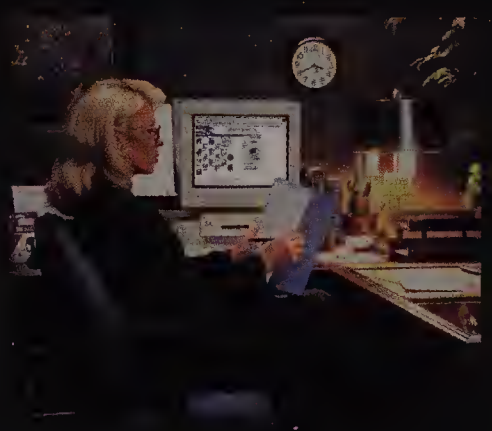

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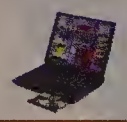
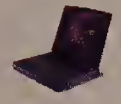
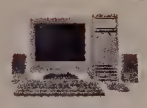
IBM		**IBM ThinkPad 600E Notebook** 26453AU Intel® Pentium® II processor, 300MHz, 32MB RAM, 4.0GB HD, 56K modem, 24x-max variable speed CD-ROM, 13.3" TFT active-matrix display, Windows® 98	$2699 $89.97/mo.*
TOSHIBA		**Toshiba Satellite 4030CDT Notebook** PAS403U-T2CW8 Intel® Celeron™ processor, 300MHz, 64MB SDRAM, 4.3 billion byte HD, 56K V.90 modem, 24x-max variable speed CD-ROM, 13.3" TFT display, Windows® 98	$1699 $56.63/mo.*
HEWLETT PACKARD		**HP Omnibook XE2 Notebook** F1723WT Intel® Celeron™ processor, 300MHz, 32MB RAM, 4.1GB HD, 56K modem, 24x-max variable speed CD-ROM, 12.1" HPA display, Windows® 95/98	$1499 $49.97/mo.*
COMPAQ		**Compaq Prosignia 330 Desktop PC** 108157-002 Intel® Pentium® III processor, 450MHz, 64MB RAM (384MB max), 14.4GB HD, 56K V.90 modem, 40x-max variable speed CD-ROM, Windows® 98. Monitor sold separately	$1649 $54.97/mo.*
Acer		**AcerPower 6100** 6100-350B Intel® Pentium® II processor, 350MHz, 32MB RAM (384MB max), 6.4GB HD, 56K modem, 32x-max variable speed CD-ROM, Windows® 98. Monitor sold separately	$899 $29.97/mo.*
Apple		**Apple iMac** Blueberry: M7440LL/A 333MHz PowerPC processor, 32MB RAM (256MB max), 6.0GB HD, K56flex V.90 modem, 24x-max variable speed CD-ROM, Mac OS 8.5, 15" display (13.8"viewable)	$1199 $39.97/mo.*
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YOUR TAKE ON: Aging floppies ◆ Online rights ◆ Web travel reservations

PRIVACY: NO SLEEP LOST

THOSE WHO SEE Intel's Pentium III processor ID as dramatic evidence that the silicon sky is falling in the privacy rights arena should stop and take a deep breath ["Intel Adds ID Number to PIII," *Top of the News*, April].

I'm not belittling the privacy argument. I work in IT at a university where people (staff and students alike) routinely and without question give out their social security numbers over the phone for identification purposes. But to have a meaningful privacy debate, meaningless lines in the sand must disappear. Ethernet cards have long had unique ID numbers readable by software. Microsoft probably has yet to disclose all of the unique IDs its software generates, from Windows 98 to Office 97 to who knows what. Let's force the whole industry to consider privacy concerns, not vilify Intel.

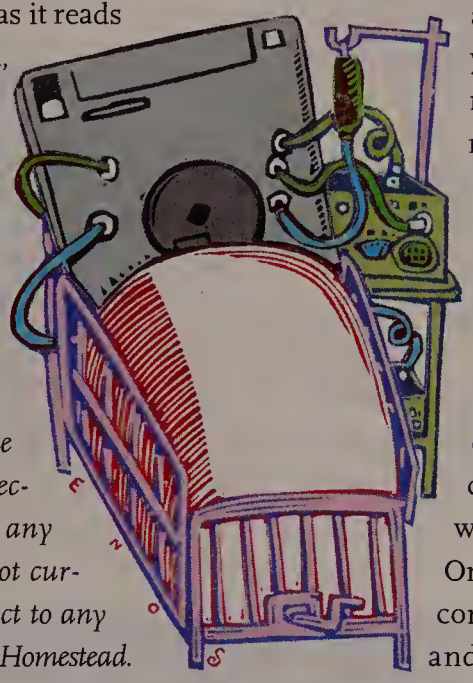
Paranoia should not reign simply because a unique hardware ID number moves from a card to a chip.

Joshua Heslinga, Williamsburg, Virginia

VIRTUAL PROPERTY RIGHTS

I PLANNED to open a free site at Homestead ["4th Annual Best Free Stuff Online," June] until I came across this clause in its terms of service (as it reads now; when I first looked, it was worded somewhat differently):

8.4 Solely for the purposes of displaying your Homestead on the Internet and for Homestead's advertising and promotional purposes, you hereby grant to us the right to exercise all intellectual property rights, in any media now known or not currently known, with respect to any content you place on your Homestead.



To those of us who make our living off of intellectual property, this clause in the User Agreement opens up a huge can of worms. You should have mentioned it in your article. For photographers especially, once an image is "out of the bag" and on the Net, tracking and copyright enforcement become virtually impossible. If an image is confined to your own site, protection measures are available, but not if your host is free to grab images willy-nilly.

And the issue doesn't affect just photographers. It's easy to imagine a killer soundtrack to the next Yahoo TV commercial being used without the creator's permission but within the terms of service. Or a company like Theglobe.com marketing key chains and coffee mugs using artwork taken from its members' sites.

Andrew Buckley, York, Maine

Editor's response: Homestead's policy (and similar ones at other free-service sites) may pose problems for some users, so always read the terms of service carefully before signing up. **–Harry McCracken**

PITIFUL SLOBS

IN THE story sidebar "Should You Wait for Windows 2000?" [May, page 130], you stated, "Sure, there are still a few folks out there using the DOS version of WordPerfect 5.1...." A between-the-lines comment was evident: "God, how I pity those poor slobs who don't have a 550-MHz Pentium III! How can they possibly get up every morning and continue to exist?"

Well, while I do have a second machine on which I do considerable software evaluation, I accomplish most of my work on a vintage Zeos 486, and I do most of my writing using WordPerfect 5.1 simply because I like it. I realize that such words are heresy, but I have the First Amendment to fall back on.

Lou Garner, Las Vegas ▶

HOT BUTTON

Can These Floppies Be Saved?

I AGREE WITH Phil Lemmons that it is past time to kill off 3.5-inch floppy drives ["Kill Floppies, Not Time," *Up Front*, June]. But until Microsoft starts delivering its operating systems on bootable CDs, PC users are stuck with floppies. BIOSs that recognize CD-ROM drives are now an industry standard. It would take only a small effort by developers to give us an OS on a bootable CD. Maybe the Linux camp can take the lead on this, and Microsoft will follow. If that happens, I guarantee you every floppy on my network will be gone.

R. Anderson, Phoenix

FLOPPIES WILL survive because they're economical and universal. As a freelance writer, I can't imagine the cost or irritation of providing my editors with articles on media that may be incompatible with their systems and that are more expensive, at least for text files. For me, though, the ideal would be to have a floppy drive *and* a removable-media drive!

Amy Pickelsimer, Cleveland, Tennessee

REGARDING "Floppy Killers?" [June] on replacements for the aging 1.44MB floppy disk and drive, and the related editorial: As much as you tout the Zip, Jaz, Clik, and SuperDisk, they will still go nowhere. People who store large files for multimedia and other apps no doubt have a CD-R or CD-RW optical drive. Why pay nearly $15 for a removable-media disk that holds only 100MB when you can pay $1 for an optical disc that you can use on any PC with a CD-ROM drive and that holds up to 650MB?

Finally, these "floppy killers" run either on a parallel port that cannot easily be shared with your printer or on a valued IDE connection. The floppy is a crutch for systems: It's there so you can boot your PC when your hard drive has a problem.

Bottom line: Limited storage, limited compatibility, expensive media, and poor choice of interfaces make higher-density disk drives a very uneconomical choice.

Anthony LaSorsa, via the Internet

ILLUSTRATION: RANDALL ENOS

NOT IN COMPUSERVE 2000

YOUR REVIEW OF CompuServe 2000 (*New Products*, June) fails to point out that CompuServe subscribers switching to the new version from "Classic" CompuServe must give up POP3 e-mail access. POP3 allows users with other e-mail accounts to receive and send all their e-mail from one client, such as Microsoft Outlook. CompuServe 2000 does not allow that capability and appears to be simply an adaptation of AOL technology; in this respect, it is a step backward from the level of service enjoyed with CompuServe 4.0.

John L. Nuss
Farmington Hills, Michigan

BEST FREE STUFF ONLINE

YOUR ARTICLE "4th Annual Best Free Stuff Online" [June] missed the best online freebie of all! On NetZero, a free ISP, the ads are annoying, but consider this: I installed NetZero as a backup ISP in case I couldn't connect to my regular service. I recently switched from Prodigy to AT&T WorldNet, partly on your recommendation. Now, with AT&T, I experience busy signals (which I never experienced with Prodigy). Here's the kicker: I've never had trouble connecting with NetZero, and it has a total of eight local access numbers in my area (AT&T has three and Prodigy two). I always get a fast, stable connection, and NetZero's software loads as quickly as AT&T's, and much faster than Prodigy's.

Dave Estes, Denver

BUT CAN YOU GET SUPPORT?

YOUR MAY ISSUE had a largely positive review of PaperPort Deluxe 6.0 ["PaperPort Now Archives Web Pages, Too," *New Products*]. But it didn't mention that there is no apparent way to obtain technical support. You can call ScanSoft at a *toll* phone number and wait on hold forever, or you can e-mail tech support in vain, as the questions go unanswered.

You should contact tech support for every *New Products* review, and report the response you get (or don't get). This would be invaluable information for many people.

Cary Posar, M.D.
Ft. Lauderdale, Florida

WEB TRAVEL SITES: HOW USEFUL ARE THEY?

YOUR ARTICLE "Booking Travel on the Web: with Reservations" [June] was right on time. I've been trying to find a good fare for an upcoming international flight for the past month. I do think you should have given tickets.priceline.com [which tells you if a flight is available at your lowest desired fare] more space. I subscribe to Microsoft Expedia Fare Tracker. However, as your article mentions, you can never find flights for the fares it reports via e-mail. With tickets.priceline.com, I found a comparable fare on a different airline from what Expedia provided and also saved about $460 on two tickets for the family over the same flights from ▶

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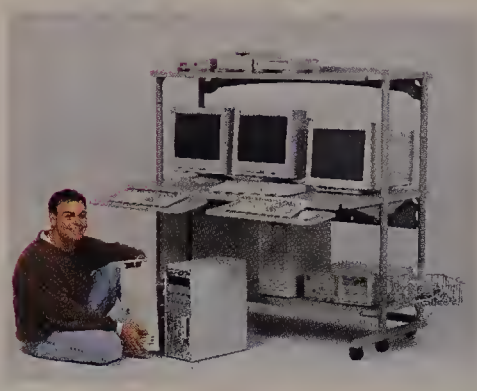

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LETTERS

Expedia. I recommend going to sites like Expedia (and the Fare Tracker option) to get a good idea of what the lowest fare should be, and then using that price at tickets.priceline.com to buy the tickets.

Jesse Tolliver, San Antonio

SOMEONE SHOULD do more research before making recommendations. In your June Web travel article, you said Expedia was the best site. I found it to be one of the most irritating I've ever seen. It told me no hotels were listed for Rockville, Maryland, and that there was no airport in Greensboro, in Charlotte, or in Raleigh-Durham, North Carolina. If this site is the best, I would hate to try the others.

Sherman R. McClure, via the Internet

WHY LIFE IS GOOD

THANKS A MILLION to Scott Dunn for "Troubleshoot and Repair Your Registry" [*Windows Tips*, June]. I'm a first-year medical student, and my time is precious. My wife's 486 PC had been down for weeks, despite my efforts to fix it. I even contacted Microsoft tech support, which suggested that I reinstall Windows. Ouch! Then your magazine arrived, and I decided I could spare 15 minutes to try the Registry tip. The system was back up in 5; my wife is back on her PC, and I'm back puzzling over the mesencephalic nucleus of the trigeminal nerve. Life is good.

John M. Balaicuis, Philadelphia

PC World *welcomes your letters to the editor.* *See page 12 for contact information.* ■

CORRECTIONS AND CLARIFICATIONS

AS WE WERE completing July's "Best Products of 1999," AT&T acquired IBM Internet Connection, which won the Best Internet Service Provider award. As of early June, IBM Internet Connection was still available to consumers. It remains unclear how and when IBM's service will be merged with AT&T's.

In July's *New Products*, our review of the Sony VAIO Digital Studio PC should have identified the model as the PCV-R528DS. Also, Sony's phone number is 888/315-7669.

The photographs in July's "Blazing Lasers" article were taken by Arnold Tiosejo.

PC World regrets the errors.

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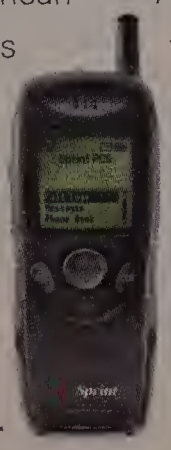

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Is AOL Losing the Fight Against Spam?

As X-rated messages crowd our children's in-boxes, some say America Online simply isn't doing enough.

ILLUSTRATION: BILL DUKE

WHEN 13-YEAR-OLD ASHLEY finally convinced her parents to let her have her own screen name on America Online, she did what most kids her age would do. She visited chat rooms, perused message boards, and exchanged e-mail with her friends.

What Ashley didn't realize, however, was that her first solo voyage through cyberspace had not gone unnoticed. Every time she posted a message on a message board or made an innocent quip in a chat room, junk mailers harvested her e-mail address—a fact that became abundantly (and offensively) clear when Ashley logged on for a second time, just 48 hours later.

"There were more than 200 e-mail messages—most of which were about porn sites," recalls Ashley's mom, Marta, who is still angry about the incident. "We've always received some junk e-mail, but never anything like what Ashley got in just a few days."

Although I've written about junk e-mail before and received more than my fair share of spam, Ashley's story stopped me in my tracks. I know that chatting and message-board postings will be part of my preteen daughter's online experience. And it makes my skin crawl to think of my daughter—or anyone else's—wading through X-rated solicitations to read the latest missive from her best friend. (With parental control features enabled, a subscriber with a "teen" designation can't actually access any of the X-rated sites advertised in junk mailings. But the messages themselves, with subject lines like "Free Porn" and "Young Nude Females," are disturbing enough.)

Ashley's experience isn't unique. Shortly after I spoke with Ashley's mom, a *PC World* editor relayed a similar experience. And since then I've heard from many parents of teens who are struggling to control the steady stream of spam that flows into their children's AOL mailboxes.

THE TARGET OF CHOICE

SPAM IS A FACT of life for anyone who has an e-mail address, but AOL users are particularly vulnerable to attack, according to leaders in the fight against junk e-mail.

AOL's content and community make it "a very different sort of system than most ISPs," according to Ray Everett-Church, an attorney for the Coalition Against Unsolicited Commercial E-Mail (CAUCE) and formerly a consultant to AOL's antispam group. Unlike other ISPs, which primarily serve as a gateway to Web-based content and services, AOL is the final destination for many of its subscribers.

And as Ashley's experience indicates, everyone from porn-site operators to get-rich-quick schemers is taking advantage of that community. "AOL is the target of choice [for spammers]," says Jason Catlett, president of Junkbusters, a Greenbrook, New Jersey, developer of online privacy tools. Harvesting e-mail addresses on AOL is as simple as calling up the member directory or writing a program that captures screen names as they appear in chat rooms or on message boards. With minimal time and effort, a junk mailer can compile those ▶

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PC WORLD

addresses into a database for spamming or for selling to other junk e-mailers.

AOL recognizes its vulnerability—as well as its role as a family-oriented service—and provides members with tools (including an array of mail controls) for customizing their online experience.

Parents of young children would be well advised to take full advantage of these controls. Thus my 7-year-old, for example, can receive e-mail only from a short list of friends and relatives. But when it comes to teens, exercising the same level of control is harder, since teenagers want and deserve more freedom than younger kids. Currently, though, parents and teens seem to have only two options on AOL: Block e-mail from all but a specified list of addresses, or deal with a barrage of spam.

"There's the **perception** at AOL that **technology** is cheaper [and better] than using **humans** to **fight spam**," says David O'Donnell.

The bottom line, acknowledges AOL spokesperson Rich D'Amato, is that anyone who frequents chat rooms and message boards is going to receive spam. As a work-around for this problem, D'Amato suggests that families dedicate one screen name for chatting and posting items on message boards, and then set the mail control for that name to refuse all e-mail. "It's a simple way for people to participate in AOL communities without worrying about spammers," he says.

MORE TROUBLE AHEAD?

FOR MANY HOUSEHOLDS, D'Amato's recommendation may work, but it doesn't address the systemwide problem of junk e-mail. And observers, as well as some former AOL insiders, wonder if the online powerhouse is doing enough these days for its subscribers—or for the industry.

In the past, AOL employed what Ray Everett-Church calls a "tremendous team" to investigate spam and follow up on abuses. But that team has effectively been dispersed, he says, as part of restructuring in the wake of the Netscape acquisition.

David O'Donnell, the former principal postmaster for America Online, shares Everett-Church's concerns about the decline of its policing efforts. O'Donnell, who left AOL in November 1998, believes the service now relies too heavily on using technology to combat spam, while deemphasizing investigative work. "There's the perception at AOL that technology is cheaper [and better] than using humans to fight spam," he says.

Though AOL's D'Amato acknowledges the restructuring, he denies that it signals a weakening of AOL's commitment to fight spam. "Technology is an ever-more-important piece of our antispam effort, but the human detective work is no less a part of our antispam effort today than it was in the past," he says.

"We're fighting spam on many fronts," D'Amato adds, pointing to AOL's recent work with the Virginia legislature to enact a law making it illegal to send e-mail with forged headers (a practice that obscures the sender's identity) or to sell, distribute, or use software designed to forge e-mail headers. The company's lawyers have also been busy filing lawsuits against individuals and companies that send spam.

IS IT ENOUGH?

IS AOL DOING all it can to clamp the lid down on spam? Do the changes resulting from the Netscape acquisition signal bad times ahead for subscribers?

It's too soon to gauge the effect of the Netscape acquisition on AOL's antispam endeavors. But from where I sit, the company still has plenty of room for improvement. We know that AOL has more families and first-time users among its subscribers than any other Internet service. No doubt these demographics pose unique challenges for the service. They also demand unique efforts.

For starters, AOL could warn parents more specifically about the volume and nature of spam they may receive. There's no mention, for example, that a mailbox might be flooded with invitations to see "Free, Explicit, Hardcore Sex."

In addition, AOL should take a more active role in industrywide efforts to ▶

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fight spam at the source. Bright Light Technologies has developed network tools to help ISPs identify and block incoming spam. Though more than a dozen ISPs have signed on, AOL has not. D'Amato says AOL reviewed the Bright Light approach but opted to focus on its own tools.

BE PART OF THE SOLUTION

OF COURSE, you can help fight spam, too. One way is to take advantage of the mail controls AOL currently offers. Antispam activists like O'Donnell also recommend following up on every piece of junk e-mail that gets through—identifying the source and reporting it to the ISP. But few of us have time to pursue that level of detective work. And is it our responsibility?

AOL users should at least forward junk e-mail to TOSspam@aol.com. According to D'Amato, staffers investigate all such items. You can also monitor spam. Does the volume increase after you visit certain chat rooms or message boards? Keep a log and alert AOL's customer service staff if you notice anything that might help them identify spammers.

Washington has taken an interest in spam control, too. The first bill to be introduced (the Inbox Privacy Act) would allow ISPs to ban spam and then seek damages from violators. Visit the CAUCE Web site (www.cauce.org) for legislative updates.

CAUCE supports an outright ban on junk e-mail. And a precedent for such a ban exists: In 1991, Congress banned junk faxes—a problem that affected fewer people than junk e-mail does today.

Opponents of an across-the-board ban argue that some people enjoy receiving spam. I have yet to meet a person who admits to this vice, but anyone who does can simply subscribe to Internet mailing lists.

Meanwhile, the rest of us can read our e-mail free of solicitations for porn, get-rich-quick schemes, and diets-du-jour.

Sounds good to me.

Fighting spam? Let us know about it at consumerwatch@pcworld.com. PC World *Contributing Editor Roberta Furger is the author of* Does Jane Compute? Preserving Our Daughters' Place in the Cyber Revolution *(Warner Books, 1998).* ■

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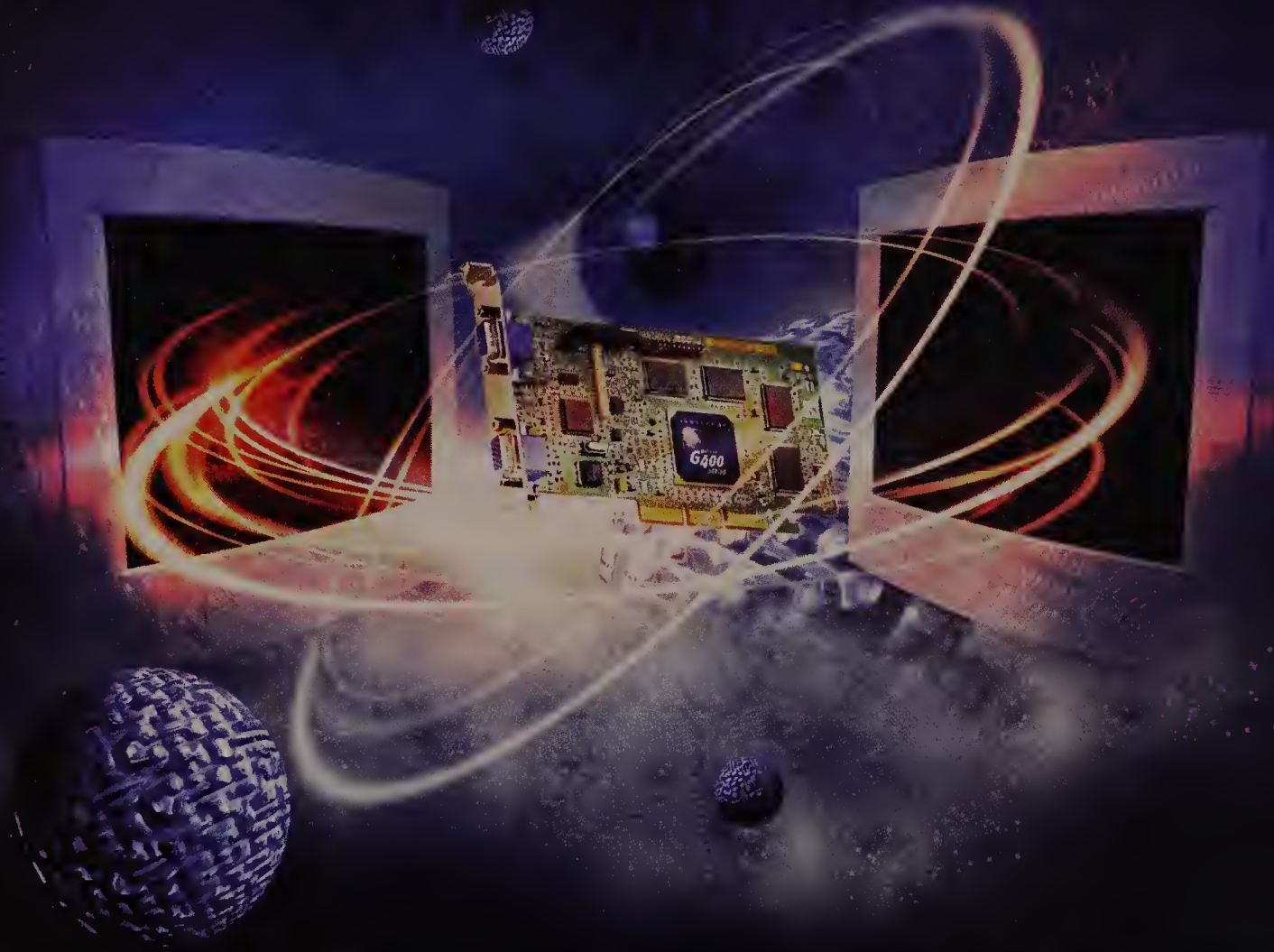

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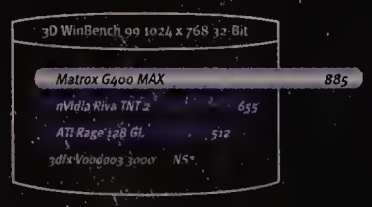

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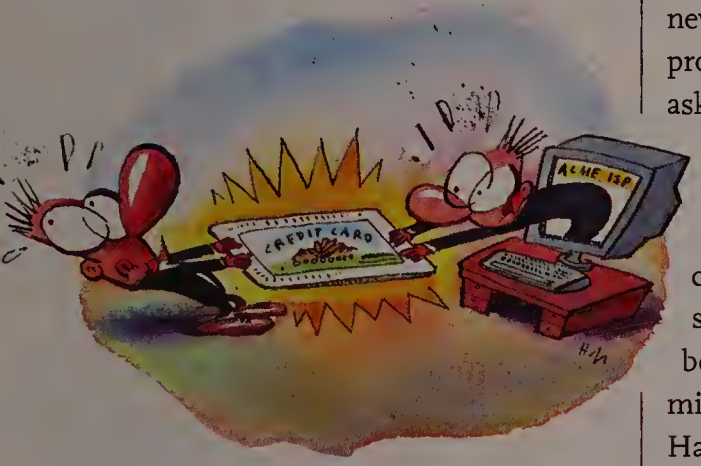
TODD TOEPFER OF MODESTO, California, writes with an extreme version of a lament I hear often. "I've been trying to get Netcom to stop charging us," he says. "I canceled my Internet account in September of 1997, but the charge still shows up every month."

Many readers have complained about ISPs and other online services billing them for stopped accounts.

The problem often starts with a free trial. Rich D'Amato of America Online suggests, "Any time you have a free trial



you want discontinued, call a representative to make sure it gets canceled." Never assume that a trial ends when you stop using the service. D'Amato also recommends that you jot down the rep's name, to help substantiate your efforts later.

Similarly, Ed Hansen, public relations manager for MindSpring (which bought Netcom), suggests you cancel services via e-mail (this isn't possible with AOL free trials) so you have a time-stamped record. In addition, he recommends that you "watch your credit card statement to make sure the charge drops off." If the charge never goes away, someone at the company probably just made a mistake. Be sure to ask for a prorated refund.

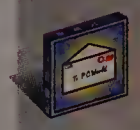
If months go by before you notice you're paying for a canceled service—or years, as happened to Toepfer because someone else pays the bills at the school where he works—you may still be entitled to a refund. "If we make a mistake we take care of it. Period," says Hansen. But your records can determine your refund. "If customers have a record of the initial cancellation, we will refund all the money," Hansen says. "If they have no record, we go back 60 days."

Fortunately for Toepfer—given the confusion caused by MindSpring's acquisition of Netcom—he did have his records in order, and MindSpring refunded all the money owed to his school.

Heads Up...

ONE UNHAPPY **Quantex** customer learned the hard way that BIOS upgrades are dangerous. He upgraded his laptop's BIOS via Quantex's Web site. It made things worse. A call to tech support revealed he'd also voided his warranty. Eric Ossenberg, Quantex customer relations manager, says that a bad upgrade "can render your motherboard inoperable" and void your warranty. He suggests upgrading your BIOS only on the advice of tech support, and claims that warnings are prominent on the site before you download (though we couldn't find any)... I got **good advice** from Dani Lane of the ATL Credit Union. In response to the April column in which a reader's checking account info was stolen and used to shop on America Online, she says victims can "contact their financial institution to explain that the charges were unauthorized. Debit transactions are done through the Automated Clearing House, and you have 60 days from the date of the charge to act"... A flurry of letters complained of problems getting online updates of **McAfee's** VirusScan. A McAfee spokesperson acknowledges the difficulties and attributes them to crowds of over 250,000 a day that visited the company's site after the Melissa and CIH outbreaks. The company is upgrading its servers, and the problem should be corrected by now.

LETTER OF THE MONTH



TWO YEARS AGO I bought an expensive Micron Millennia Transport P133 laptop. Since then I've replaced three hard drives, two external keyboards, the onboard keyboard, the BIOS, the DC/DC board, and a port replicator. This is absurd. I want a refund, or an entirely new computer—that works. I'm aware that "refunds are only granted to computer owners within the first 30 days." But my warranty expires soon. What do I do then?

Ryan Gaffney, Portland, Oregon

***PC World* responds:** I contacted Micron, and Kenneth Knotts, portables reviews manager, quickly responded with an apology. Apparently, Gaffney simply fell through the cracks. According to Knotts, Micron's policy is to replace a system that suffers three hardware problems. Micron then called Gaffney to ask him what replacement he would like. Today he is the happy owner of a Millennia 450 Full Tower desktop, loaded with 128MB of RAM, a 15GB hard drive, and a DVD-ROM drive. ■

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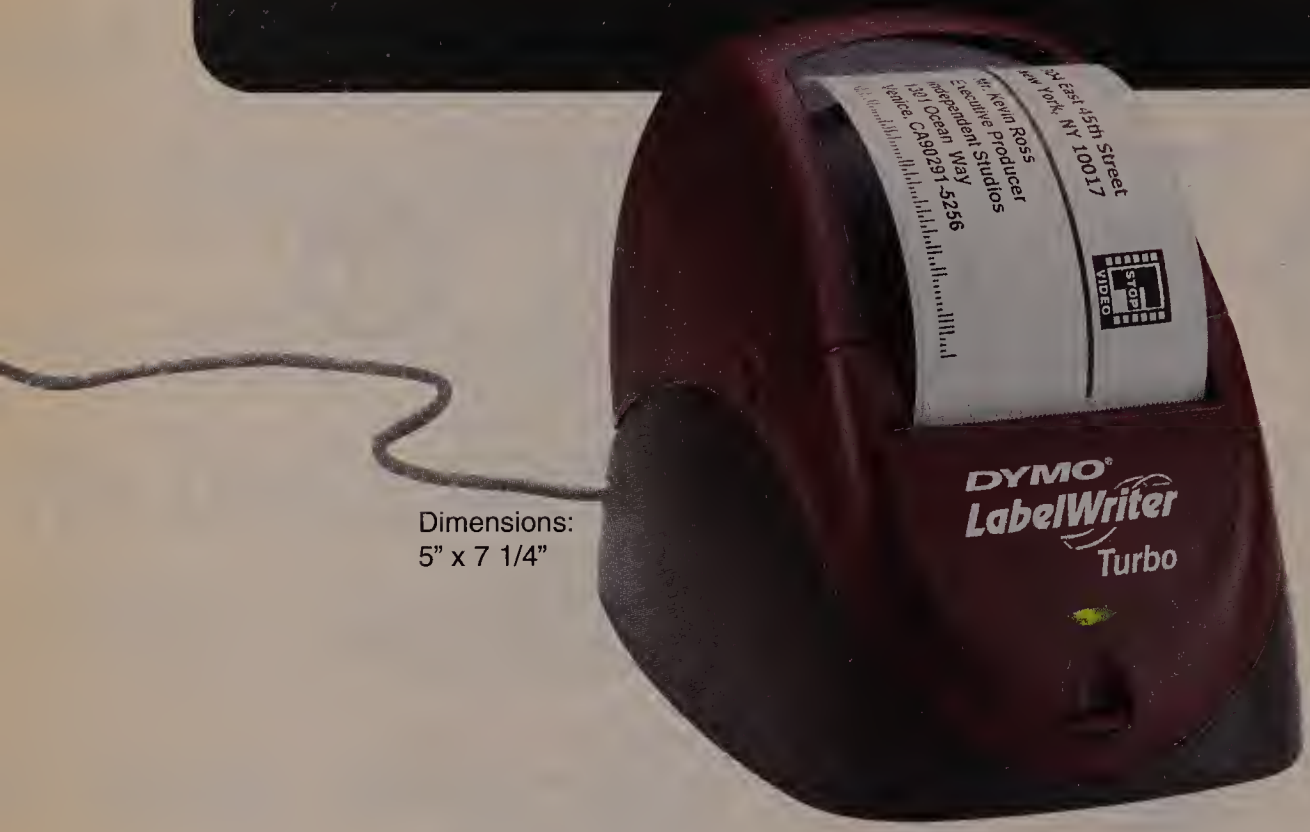

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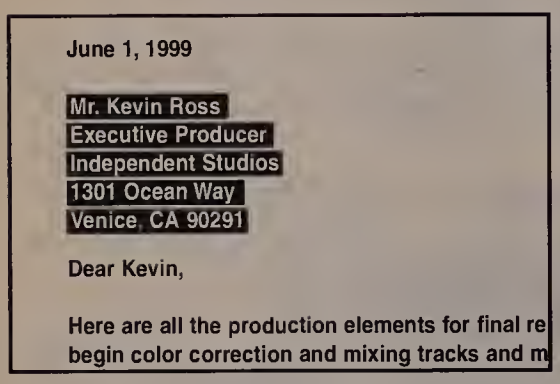

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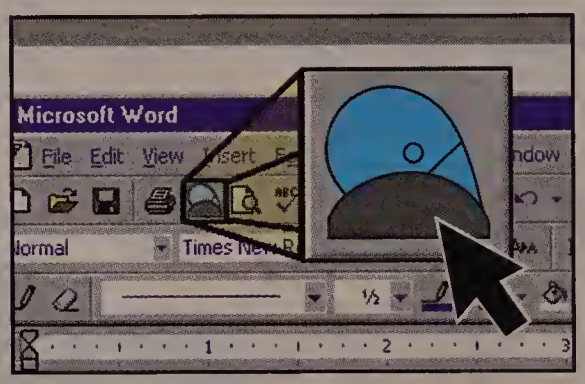

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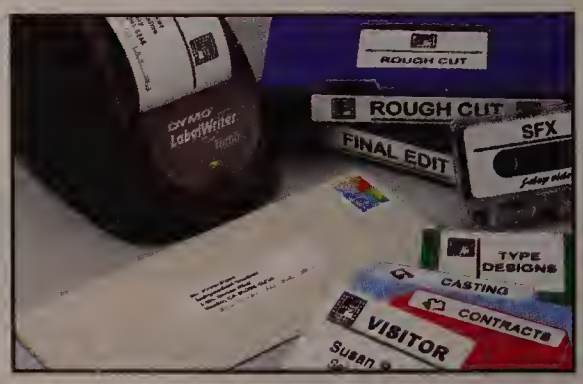

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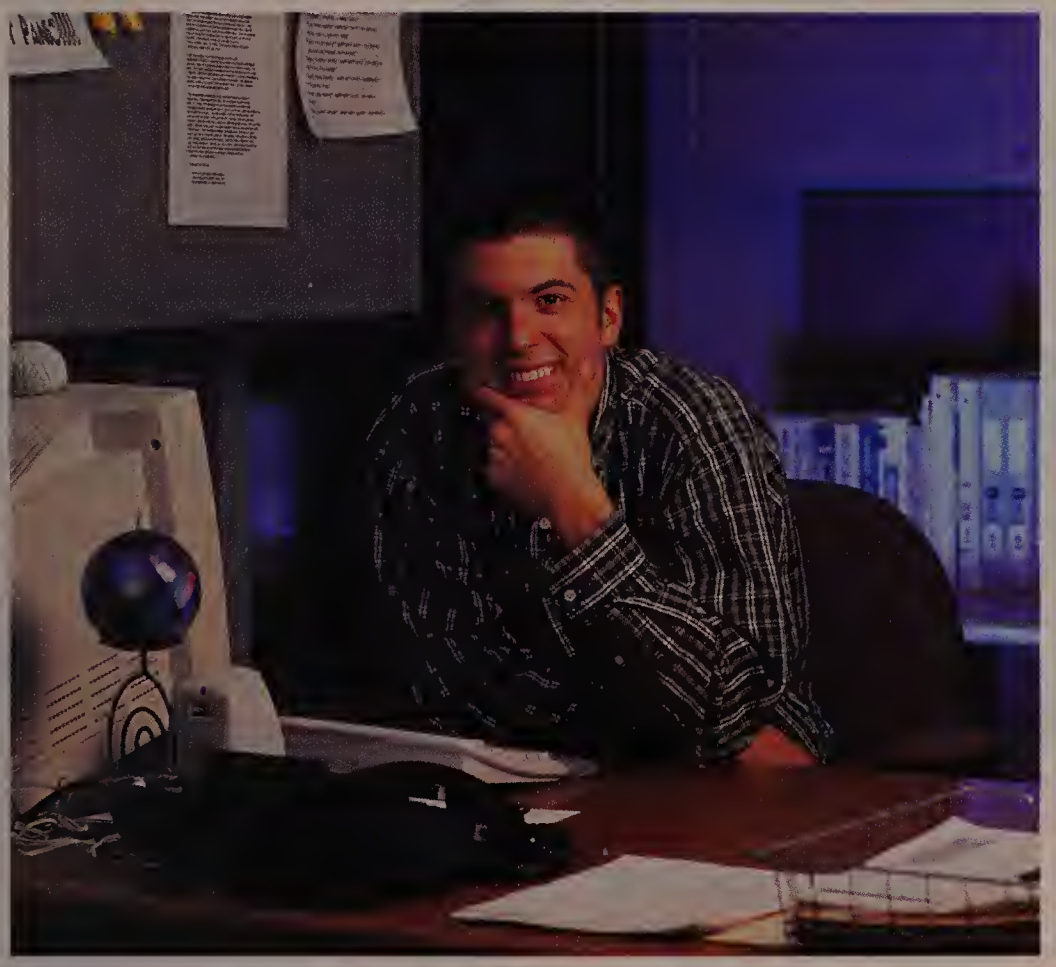
Moving On Up to a New ISP

PROBLEM *Shoddy service is compelling you to switch to a new Internet service provider.*

SOLUTION *Take a few simple steps to make the move as painless as possible.*



PHOTOGRAPH: DAN WHITE

CAMERON SHOVE, information systems manager of a medical cost management company in Kansas City, Kansas, is none too pleased with his Internet service provider, Cable & Wireless. "I get busy signals and dropped connections," he complains. "That makes it difficult to work, because I access my office's network from home using this ISP." So Shove has auditioned several other providers and will soon switch to Teranet, a local ISP with a solid reputation.

Though switching ISPs is not Shove's favorite pastime, Teranet will be his fifth one. Getting adjusted to a new provider is never pain-free: "Many ISPs have setup software that's too automated, without making it clear you can set your own preferences," he reports. "At the opposite end of the spectrum, others just send you a text document of setup instructions that aren't at all user friendly."

Most Netizens aren't as nomadic as Shove, of course. Still, even one ISP move involves everything from installing and configuring software to ensuring that correspondents know your new e-mail address. But you can keep the relocation from being unduly stressful.

The first rule is simple: Allow at least a month's overlap in services. You want to make sure you're satisfied with your new ISP before canceling the old one and that your important contacts have your new e-mail address. Choose a new provider that offers the first month of service free (many do, including Concentric, IBM Internet Connection, and MSN), and this overlap period won't cost you anything extra.

GO RECONFIGURE

MAYBE YOU'RE A FAN of Netscape's Navigator Web browser and Messenger e-mail client, but you're switching to an ISP that installs Internet Explorer and Outlook Express when you run its setup software. Or perhaps it installs Navigator and Messenger but you prefer Explorer and Outlook. In either case, you shouldn't have to switch to your new ISP's bundled software. Once Windows' Dial-Up Networking is set up for your new ISP (a job the service's setup software typically handles), your existing browser should work fine over the new connection.

However, if you set your system to dial your new ISP when you access the Internet, but it still connects to your old ISP, tell Windows to use your new ISP instead. In Windows 95, go to the Control Panel and double-click the *Internet* icon, then select your new ISP in 'Use the following Dial-Up Networking Connection' and click *OK*. If you're using Win 98, go to the Control Panel and double-click *Internet Options*, then click on the *Connections* tab. Select the new ISP in the 'Dial-up settings' box, then click the *Set Default* button and click *OK*.

You may need to configure your e-mail package so it checks the new ISP's mail server—a task that differs depending on the ISP and e-mail client. Consult your new ISP's tech-support staff (or Web-based help) for instructions.

To alert correspondents of your new e-mail address, you can broadcast an e-mail with ▶

the details to everybody in your address book. Even so, you'll want to monitor both accounts during your overlap period; this task is easy with any e-mail application that can check multiple accounts, such as Outlook Express or Eudora Pro.

If you decide to use the e-mail package your new ISP supplies, the changeover will be easy if you're switching from Outlook Express or Messenger. Many ISPs' setup routines will automatically convert these programs' address books for use in the e-mail clients they supply. But few ISPs, with the exception of EarthLink, can transfer America Online address books.

Here's the simplest way to transfer addressees from AOL into your new ISP's e-mail program: In AOL, send a boilerplate message to everyone in your old address book, asking them to reply to your new address. Many e-mail packages, including Outlook Express and Netscape Messenger, can automatically add addresses from incoming e-mail.

PLAYING FAVORITES

THE SETUP ROUTINES of many ISPs will automatically grab your existing browser's bookmarks (aka *favorites*) and transfer them to the new ISP's browser. If your new ISP doesn't, you can convert bookmarks yourself (see "One Desktop, Two Browsers, 72 Tips," November 1998, www.pcworld.com/nov98/browsertips). IE 5 even has a conversion wizard; select *File•Import and Export...* to use it.

Once again, AOL users have it tougher; not many ISPs transfer favorites from AOL's browser. But SyncIt.com (www.bookmarksync.com) says it is upgrading its free utility, BookmarkSync, to convert AOL favorites for use elsewhere.

HOME SWEET WEB SITE

NO ISP WILL move Web pages for you. So if you've got a Web site on your old ISP's server, you'll need to relocate it to your new provider. The easiest way is with an FTP utility such as Ipswitch's $38 WS_FTP Pro 6.0 (a free trial version is available for downloading from www.ipswitch.com). Once you've moved your site, replace the version at your old ISP with a link to the new URL.

If you switch ISPs often, the ultimate convenience is to get your own domain name, such as *YourNamehere*.com. This lets you keep a single, memorable e-mail address and URL no matter how much you hop around. Services such as Mydomain (www.mydomain.com) let you do this for a typical cost of $85 for the first year and $35 to $60 per year after that. For details, see *Got a Problem?* March (www.pcworld.com/mar99/gap).

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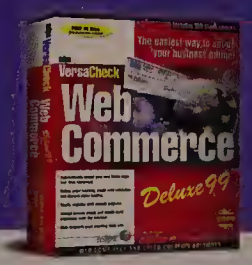

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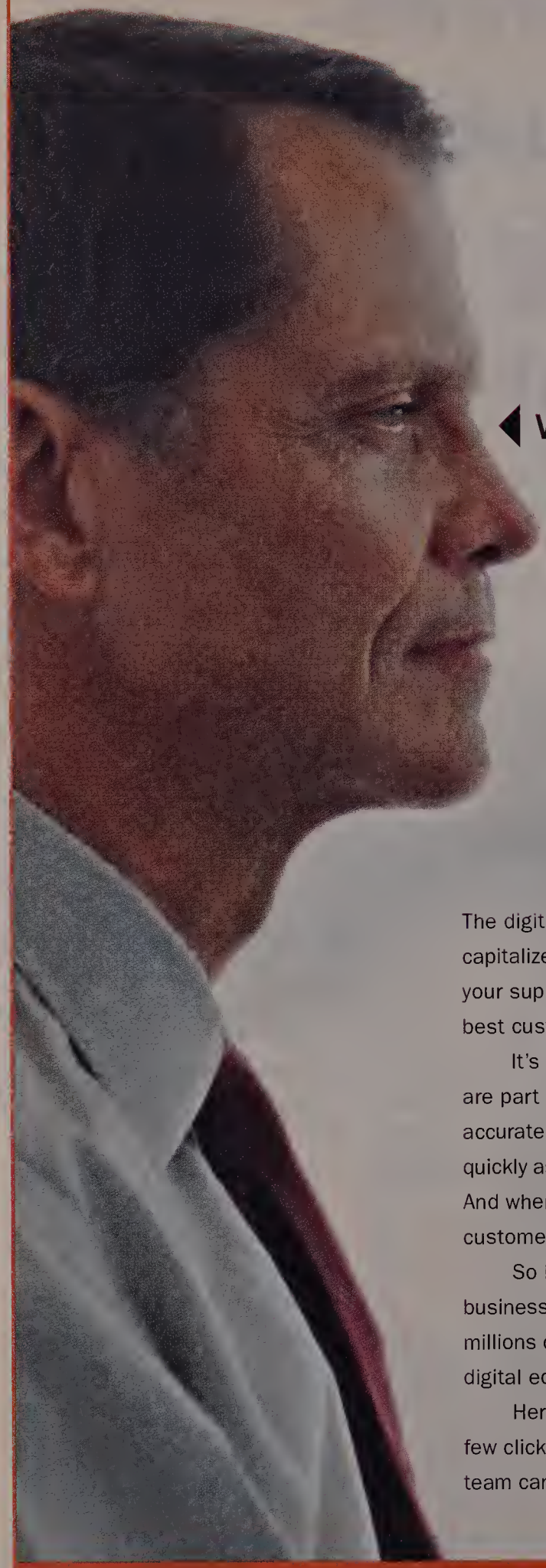

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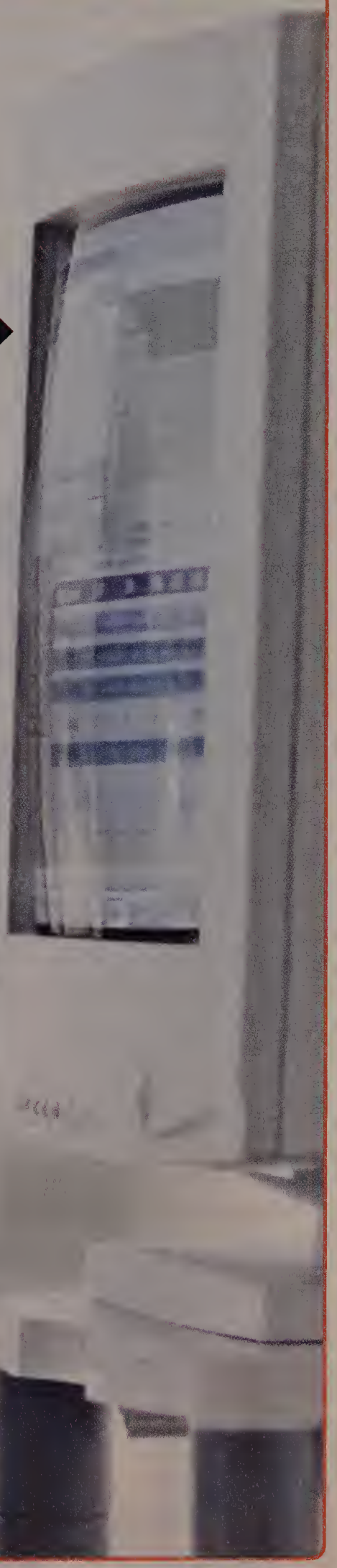

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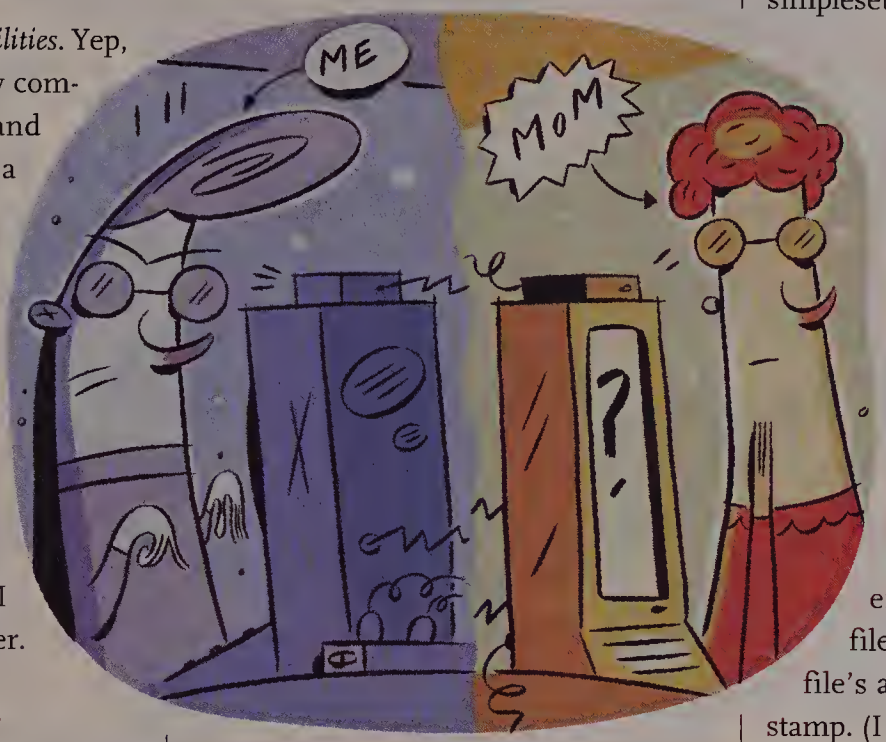
Cool Tools That Windows Forgot

I HAVE ONE word for you. *Utilities.* Yep, give me a tool that makes my computing life faster or easier, and I'm happy. (Still a dweeb, but a happy one.) So I'm going to tell you about a handful of my favorites.

I've tried what feels like a thousand different utilities. (I know. *Hey, Bass, get a life,* right?) But to make it onto my system, a utility must pass a critical test: I use it for 30 days, then uninstall it. If I notice it's missing, it's a keeper.



THE MISSING LINK

HERE'S A TRUE story. My mother calls. "Bass International tech support," I say, "Can I help you?" (Caller ID—and she's amazed every time I pull this stunt.) A dozen graphics files are lost somewhere on her PC, and she can't find them.

Ordinarily, I'd hop in the car, schlep across town, and work on her system. But it's rush hour, this column's already late, and I know she'll make me stay for dinner. So I fire up Traveling Software's Remote DeskLink and click on my mother's phone number. In a few seconds, her PC is on my screen and I'm using Windows Explorer to wend my way to the hidden files, just as if I were really there.

For years I've avoided heavy-duty remote control programs like Carbon Copy, because I've found them hard to use. (Are you the host? No, I'm the *guest.* I think.) But DeskLink is easy to use, and except for one shortcoming it's also powerful.

Even with a so-so 56-kbps connection, DeskLink lets me access Mom's system surprisingly quickly. The secret? The program caches her screen display to my hard drive, speeding up subsequent connections. DeskLink's only downside is its reliance on Windows' Cut and Paste commands to transfer files. For more sophisticated file-transfer features, you'll need DeskLink's bigger cousin LapLink.

In a few seconds, Mom's PC is on my screen, and I'm searching for her lost files as if I were there.

DUCK AND COVER

I NEED TUNES playing while I write this column, so I have my PC's CD player running in the background. But with so many apps in action, my taskbar becomes cluttered. Not any more: OuttaSight lets me hide rarely used items or stash them in the system tray. Very cool—and free.

Just as neat is OuttaSight's counterpart, PushPin, a handy piece of freeware that keeps an application on top of other windows. I use it to monitor an app's progress—say, a download—while I'm doing something else. When I want quick access to Windows Explorer, I shrink the size of Explorer's window and use PushPin to keep it in sight. Find both apps at rosa.simpleset.com/software/005/index.htm.

Remote DeskLink
$50 list; Traveling Software Inc.; 800/343-8080; www.travsoft.com
PRODUCT INFO NO. 601

NetSwitcher
$8 shareware; J. W. Hance; www.netswitcher.com

WHAT'S IN A NAME?

I ADMIT IT: I used to have trouble renaming files using Windows Explorer. I might type in the wrong file extension. Then when I double-clicked the file, Windows would act like it had never seen the thing before.

But that was back in the days before I discovered Kish Designs' PropertiesPlus, a handy, free add-on for Explorer. PropertiesPlus lets me highlight a file, right-click it, and modify the file's attributes, extension, and time stamp. (I use it when I'm late with a column—I change the date to a few days earlier and blame slow e-mail.) Get it at www.nc.jp/asahi/cool/kish.

NETWORKING? TRY THIS

ONE DAY YOU may find yourself fiddling with your PC's network settings. Some of you will blithely ignore my words of wisdom to back up your hard disk. So here's an easy alternative: Save a copy of just your network settings with NetSwitcher, an $8 shareware gem. The utility is designed for users of Windows 95, 98, and NT who need to connect two computers with different network settings. But NetSwitcher's Save feature is a nifty way of preserving—and later, if necessary, restoring—those settings. It's great insurance and a real bargain.

online *You can find files mentioned in this article at www.fileworld.com/magazine, and you can find a list of other useful utilities at www.pcworld.com/aug99/home_office.* PC World *Contributing Editor Steve Bass is president of the Pasadena IBM Users Group.* *See page 12 for contact information.* ■

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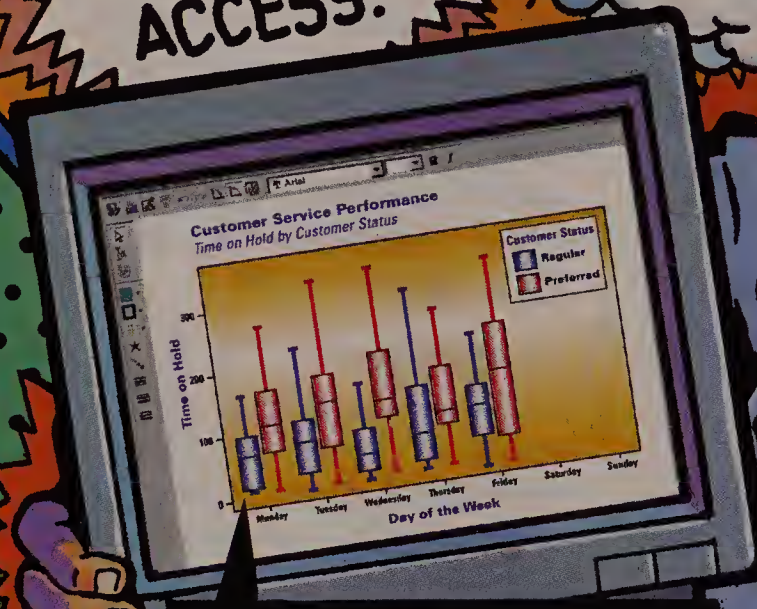

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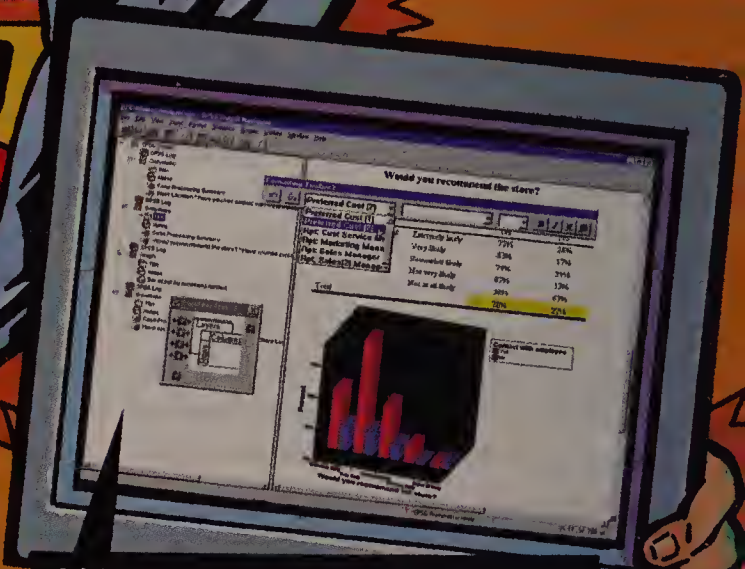

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Windows 98 Service Pack 1 ◆ The newest Navigator ◆ More IE 5 jive

Windows 98: Pick Your Patch

THE FIRST REPORTS of an impending Windows 98 service pack surfaced only weeks after the operating system shipped last year. Those rumors proved premature, but as of late June Windows 98 Service Pack 1 should be available at Microsoft's Windows Update Web site (www.microsoft.com/windowsupdate). As we went to press, Microsoft stated that some of the included fixes are USB and networking updates. The company said the patch will be at least 15MB.

If this sounds like more megabytage than you care to download, consider purchasing Microsoft's Windows 98 Second Edition Updates instead. This $20 package has several enhancements to Windows 98 not provided in SP1—including Internet Connection Sharing, expanded hardware support, Internet Explorer 5, and NetMeeting 3. To order, call 888/287-9755, or fill out the form at www.microsoft.com/windows98.

EXCEL 97 VIRUS ALERT

BUG Microsoft is tight-lipped about the evidence, but Excel 97's macro virus checking is less than 100 percent effective. Under certain circumstances—if the Excel workbook is password-protected, for example—a determined virus author can hoodwink Excel into running macro code without warning. Ordinarily, Excel posts a warning dialog box that gives users the opportunity to prevent the macro from executing.

FIX To fix the problem, Microsoft posted a 2.73MB patch at officeupdate.microsoft.com/downloadDetails/xl8p6pkg.htm. Because this patch works only with the Service Release 2 version of Excel, you'll have to update your copy of Office first (for details, see officeupdate.microsoft.com).

COMMUNICATOR 4.6, GUNINSKI 3

A SCANT COUPLE of months after releasing Communicator 4.51, Netscape has already posted a new version of Communicator. Version 4.6's improvements include updated incarnations of the AOL Instant Messenger chat 2 utility and RealPlayer G2, and various security hole fixes. To update your current version, choose *Help•Software Updates*; or you can download the complete 15MB version from ftp.netscape.com/pub/communicator/4.6/english/windows/windows95_or_nt/complete_install/cc32e46.exe.

Within days of the update's release, Bulgarian browser-security sleuth Georgi Guninski found three flaws. These holes allow HTML authors to access your Navigator bookmarks, cache, and configuration files; browse your hard disk; and read local files on your system. For more details about these security gaps, walk over to some other unsuspecting fool's computer and check out Guninski's Web site at www.nat.bg/~joro.

THE IE 5 SAGA CONTINUES

STILL NO WORD from Microsoft on an IE 5 Service Pack, but problems—and work-arounds—keep cropping up. Here are two:

BUG If you use Windows NT 4.0 and have installed Service Pack 4, IE 5 will fail when it attempts to install Outlook 98. This happens because IE 5's more stringent security won't let you run unsigned binary files.

WORK-AROUND Choose *Tools•Internet Options•Security*, click the *Custom Level* button, click *Enable* under 'Download unsigned ActiveX controls', and click *OK* twice to save the setting.

BUG Run into problems with Network Associates' First Aid 98 or First Aid 2000 after you installed IE 5? The utilities don't get along with the new Internet Explorer, because of changes in .dll files, according to Network Associates.

FIX A 715KB patch covering both First Aid editions is available at downloaduswest.mcafee.com/updates/faie_update.asp.

You can find files from this article at www.fileworld.com/magazine. Scott Spanbauer is a contributing editor for PC World. ■

IN BRIEF

Fixing Guard Dog 2.0

THE LATEST update to McAfee's Guard Dog utility heals the program's incompatibilities with other utilities and Netscape's cache cleaner, and updates its antivirus engine and virus signature file. Get the 2MB patch from support.nai.com/files/grd/prm/gd205upd.exe. Another Guard Dog tic blocks creation of a disk in the emergency disk set. Find a 75KB fix at support.nai.com/files/grd/prm/gdedupdt.exe.

Windows 95 Y2K Update

PC WORLD readers have asked how to get the 2.17MB Win 95 Y2K patch mentioned in June's *Top of the News* ("Y2K Report," www.pcworld.com/jun99/y2k_report). It's at www.microsoft.com/windows95/downloads/contents/wurecommended/s_wufeatured/win95y2/default.asp.

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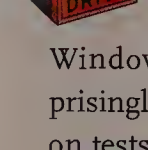
TOP OF THE NEWS

Despite **some rough edges,** Microsoft's next operating system **combines rock-solid** reliability with the **friendly face** of Windows 98.

By Scott Spanbauer

WINDOWS 2000

Smart, Stable, Still Needs Work



IT'S SMART. It's sturdy. And if Microsoft can smooth some remaining rough edges, Windows 2000 will be surprisingly desirable. In hands-on tests, the latest prerelease version of Windows 2000 Professional proved compatible with more hardware and software than Windows NT Workstation 4.0 and friendlier to portable computing. It may not run well on older computers or on systems with 32MB or less of RAM. But if you have the right hardware and want a more stable operating system than Windows 98, upgrading to Windows 2000, which is expected to ship this fall, could make sense.

We installed the third official beta version of Windows 2000 Professional on two desktop PCs and one portable computer. ("Professional" is what Microsoft now calls the desktop version of the OS formerly known as Windows NT Workstation; Windows 2000 will also come in several server flavors.) Windows 2000's gently updated menus and utilities will make Windows 98 users feel right at home. And Windows NT 4.0 users will breathe a sigh of relief as features they had to cajole into working, or despaired of using at all, now simply work. Our main complaints—still-scanty driver support and an occasionally bumpy installation routine—are the kinds of problems Microsoft is focusing on in the final days of development.

INHERIT THE WINDOWS

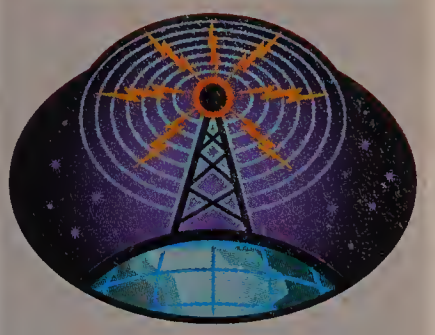
UPGRADE is Windows 2000's middle name. Though directly descended from Windows NT 4.0 (Microsoft had originally planned on calling the new OS Windows NT 5.0), Windows 2000 is the first 32-bit operating system that will upgrade cleanly from Windows 95 and Windows 98.

Sure, Windows NT 4.0 will install onto a Windows 95 or 98 system, either replacing the existing OS or creating a dual-boot configuration. But it won't pick up existing Windows configuration settings or installed applications. Windows 2000 gives you the same basic choices—replace the existing OS or add Windows 2000 as a second OS. But when you choose the upgrade option, the new OS inherits your old settings and applications. (Veteran OS upgraders may still opt for the clean install, since it's likely to minimize conflicts with existing applications and .dll files.)

I experienced no major problems when upgrading Windows 98 to Windows 2000 on a Micron Pentium III-500 desktop machine with 128MB of RAM. First, the setup program asked me whether I wanted to stay with the existing FAT32 file system or convert to the NT File System. Unlike NT 4.0, Windows 2000 can read, write, and boot from drives partitioned with Windows 98's efficient FAT32 file system. If you want to dual-boot Windows 98 and NT 4.0, you are forced to use ▶

ILLUSTRATION: STEVEN LYONS ICONS: JEFFREY PELO

JUST IN



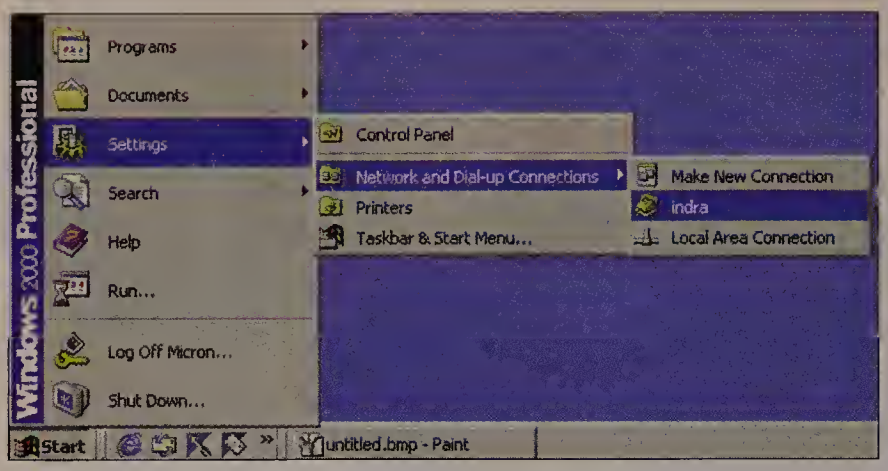
Cheap, Easy ADSL

INDUSTRY STANDARDS for an affordable version of ADSL Internet access, dubbed G.lite, is being finalized. Look for G.lite and combination V.90/G.lite modems from leading vendors to begin shipping this summer. The technology offers speeds of up to 1.5 mbps downstream (to your computer) and 384 kbps upstream. The resulting all-you-can-eat, always-on Net access works over regular telephone lines. Regional Bell companies and their competitors will sell G.lite access services to consumers for approximately $50 per month. Expect the first service announcements in late summer, with more to follow in September and October.

Wireless LANs Get Real

WIRELESS LANs—which use radio waves instead of wires to connect PCs—are about to become faster and more affordable. 3Com is expected to unveil an 11-mbps LAN card this fall for well below the $400 to $500 now standard for such speed. And one vendor, which prefers to remain anonymous, says that at this fall's Comdex it plans to introduce a wireless product capable of 100-mbps data transfer. By comparison, most wired LAN products today operate at either 10 or 100 mbps. ▶

GET UP-TO-THE-MINUTE NEWS about computer products and Internet happenings from PC World Online's News area. Just point your browser to www.pcworld.com/pcwtoday.



DIAL-UP NETWORKING is now handily located right off the Start menu.

the space-wasting FAT16, which cannot handle disk partitions bigger than 2GB. (Windows 2000 will read FAT16 partitions, if necessary.) Security-minded Windows 2000 users who don't need to dual-boot will want to convert to NTFS, which enables file- and folder-level security and encryption. I chose NTFS, and the conversion proceeded without a hitch.

Next, the setup program scanned my system for potential compatibility and driver problems. It found only a handful. Although Microsoft promises that Windows 2000 will ship with much more hardware support than Windows NT 4.0 did, it will probably still lag behind Windows 98 in that department. The Windows 2000 setup program permits you to print a list of incompatible hardware and software, back out of the installation, and boot into Windows 9*x*, where you can uninstall incompatible applications and track down the missing device drivers.

My list of offending hardware consisted of the PIII-500 machine's Creative Sound Blaster Live Value sound system, a forgivable oversight in a beta but one that Microsoft had better correct by the time the new OS ships. If I'd had the driver disk handy, Windows 2000 would have copied the NT 4.0 driver files immediately. Instead, I updated the drivers after finishing installation. If neither Microsoft nor the hardware manufacturer has written a Windows NT– or Windows 2000–compatible driver, you're sunk—Windows 9*x* drivers that don't conform to the Windows Driver model specification won't work.

The setup program also reported that several of my utilities—including Diamond Multimedia's InControl control panel and PowerQuest's DriveMapper (part of PartitionMagic)—would not work and that I'd need to upgrade them to new, Windows 2000 versions. However, the programs that really matter to me—productivity applications, e-mail, and Internet utilities—all worked perfectly after the upgrade.

Upgrading an older Pentium MMX-166 system with only 32MB of RAM—Microsoft's minimum hardware configuration for Beta 3—was more challenging. Chalk it up to the software's beta status, perhaps, but Windows 2000 gave me a surprisingly hard time with two common peripherals that Windows 98 takes in stride. First, its Hardware Wizard couldn't properly detect my Dell monitor and installed a generic driver for it. No big problem, except that when I attempted to install the correct driver from the wizard's list, it warned me that my choice was incorrect (it wasn't). More disturbing, Windows 2000 couldn't install my U.S. Robotics Sportster internal modem, even when I bypassed the Hardware Wizard and picked my modem from the list of available drivers.

After I completed the clean install to another partition, performance was noticeably slower on my Pentium MMX-166 computer than under Windows 98. Predictably, boosting RAM to the recommended minimum of 64MB yielded snappier performance.

> The programs that **really matter** to me—productivity apps, **e-mail,** and Internet utilities—all **worked perfectly.**

A FRIENDLY NT?

IF YOU'VE ever labored to configure Windows NT 4.0, you know frustration. Utilities for setting system parameters are scattered all over the place, and almost none of them are located where you would find them in Windows 98. Fortunately, Windows 2000 brings Windows 98–style usability to its menu and utility layout.

Windows Network Tricks

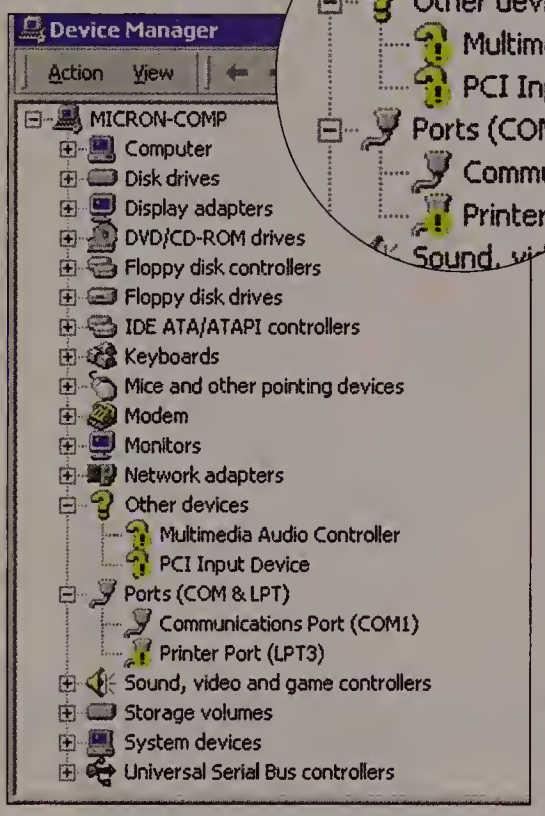
IF WINDOWS 2000 Professional is coming to your desktop, Windows 2000 Server may soon play a role there, too. Two new technologies in the server versions of Windows 2000—Active Directory and IntelliMirror—have the potential to change the way you use PCs at the office.

Active Directory is a database where Windows 2000 Server stores information about users and peripherals on the network. It can store data about your desktop settings, the applications you use, and your system's hardware configuration.

IntelliMirror can then use this information to set you free from your PC. With IntelliMirror installed, you can log in from any PC on the network and see the same desktop, Start menu options, and Favorites you'd normally see on your home-cube display. The trick works for road

ILLUSTRATION: STEVEN LYONS

For example, most of Windows 2000's configuration tools are now conveniently consolidated in the Control Panel. Windows 2000 also inherits Windows 9*x*'s Device Manager, which shows you at a glance whether a piece of hardware is working or not and lets you update the driver, tweak configuration settings, and reinstall or remove the device from one convenient interface. Windows 2000 also adds the Hardware Wizard, which can help you find and install the driver you need. And should a key device driver fail completely, Windows 2000 now offers the same safe-mode boot options as Windows 98.



WINDOWS 2000'S Device Manager lets you manage all hardware devices from one spot.

Windows 2000's implementation of Dial-Up Networking is also a vast improvement over the one in NT 4.0. Renamed "Network and Dial-up Connections," the remote networking and Internet connectivity tool replaces NT 4.0's dialog box with Windows 95/98's icon-based interface. Double-clicking on the Make New Connection icon starts a wizard that lets you choose from five types of connections: dial-up to private network (such as a corporate local area network); the Internet; a Virtual Private Network (connecting to a remote LAN over the Internet); incoming connections; and direct connections to other systems. A handy shortcut to Network and Dial-up Connections is available on the Start menu's Settings submenu.

I couldn't test every major commercial application under Windows 2000 Professional, but the dozen or so I did try—including Microsoft Office 2000, Netscape Communicator, Adobe Acrobat, WinZip 6.3, and the games Myst and Riven—ran flawlessly. The only exceptions that I found were the hardware-related utilities flagged by the Windows 2000 installer. Microsoft maintains a roster of nearly 1000 current and forthcoming applications it says will be compatible with Windows 2000 (see "Four Tips for the Switch, page 62"). Games written to use Microsoft's DirectX multimedia programming interfaces will run under Windows 2000. Most MS-DOS–based games and some Windows 9*x* versions, however, won't.

Windows 2000 also promises to be the first NT to work well with laptops. I encountered some beta bugginess when I performed a clean install on a Pentium II-400 notebook with 64MB of RAM, but the problems are minor compared to those that users would face under NT 4.0. The old NT lacks Plug and Play, limiting both PC Card and docking functions, and it has no support for power management, Universal Serial Bus, infrared, or DVD—all technologies commonly found on today's portable PCs. Although you can piece together a functional NT 4.0 laptop using third-party utilities, that OS's hardware support falls far short of Windows 98's.

A MOVABLE FEAT

WINDOWS 2000 changes all that. For one thing, it (like Windows 98) supports the two major power management specifications in use ▶

warriors and branch-office itinerants, too. Network administrators can also use IntelliMirror to install applications to your system remotely and ensure that standard applications and OS features are available to all users.

Active Directory is part of Microsoft's ongoing effort to replace Novell NetWare in the hearts and minds of LAN administrators. NetWare has remained the dominant network operating system thanks in large part to its core NetWare Directory Services database. Like Active Directory, NDS helps network administrators to keep track of users and network peripherals. Novell has incorporated IntelliMirror-like functionality into new versions of NetWare.

The upshot: No matter which network operating system is running your LAN, your desktop will follow you wherever you go.

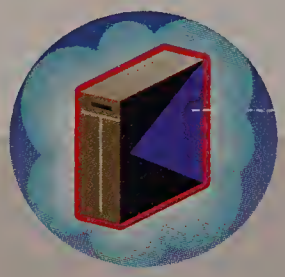
Free E-Mail Services With Extras

WHALEMAIL (www.whalemail.com)—a free, Web-based e-mail service—lets Net users share large files that a mail server would otherwise block. You can upload as much as 50MB of files at a shot to the WhaleMail server, then e-mail recipients a hyperlink to download the files. HushMail (www.hushmail.com) lets you encrypt important messages for free (the site has encryption tools). The catch: Only e-mail to other registered HushMail users is encrypted. (You can still send regular e-mail to anybody via HushMail.)

Tidbytes

Better Removable Storage for Notebooks: Iomega's $200 Clik PC Card Drive fits into a Type II PC Card slot and requires no extra cables or batteries. The drive comes with one 40MB Clik disk; extras cost $15 apiece in a two-pack. Competing media such as CompactFlash or PC Cards cost about $100 or more for a single 40MB storage disk. **Cable Modem Built for Sharing:** Early next year, Zoom Telephonics says, it will introduce a cable modem with built-in networking features. The $300 Zoom/Cable Modem circuitry will allow the modem to share data with PCs that support Home PNA, a technology designed to transform the phone wiring in your walls into a LAN. The device will also include a slot for a $230 wireless LAN card from Zoom.

today—the relatively new ACPI scheme (which is supported by Fujitsu, Hewlett-Packard, and Toshiba, plus every major BIOS vendor) as well as the older APM spec. Both Windows 2000 and 98 allow your computer to switch to a low-power standby mode when inactive, but Windows 2000 adds an additional power-saving mode: It puts your system into a no-power hibernation state by writing the current contents of memory, including open applications and files, to disk. Resuming from hibernation takes only seconds, locating you exactly where you left off.



Four Tips for the Switch

SO YOU'VE decided to brave the waters and upgrade up to Windows 2000. Here are some tips to ensure a safe journey.

1 Before you commit to the upgrade, make sure the new OS will work with your PC. Check Microsoft's hardware compatibility list, and ask your peripheral vendors whether their hardware will work under Windows 2000.

2 Before you cast your lot with Win2K, make sure the apps you use every day will run. Check Microsoft's software compatibility list (msdnisv.microsoft.com/windows/professional/deploy/compatible/search.asp) and call your software vendor.

3 When upgrading from Win 98, print out Windows 2000's list of items that are incompatible with your system, then cancel out of the installation. After you remove or rectify trouble areas, start the installation process over.

4 Don't bet the farm on Windows 2000 this year. It will take six months to a year for Windows 2000 Professional's bugs—and fixes—to emerge into the open. Wait until the service pack appears before upgrading whole offices or departments to the new operating system.

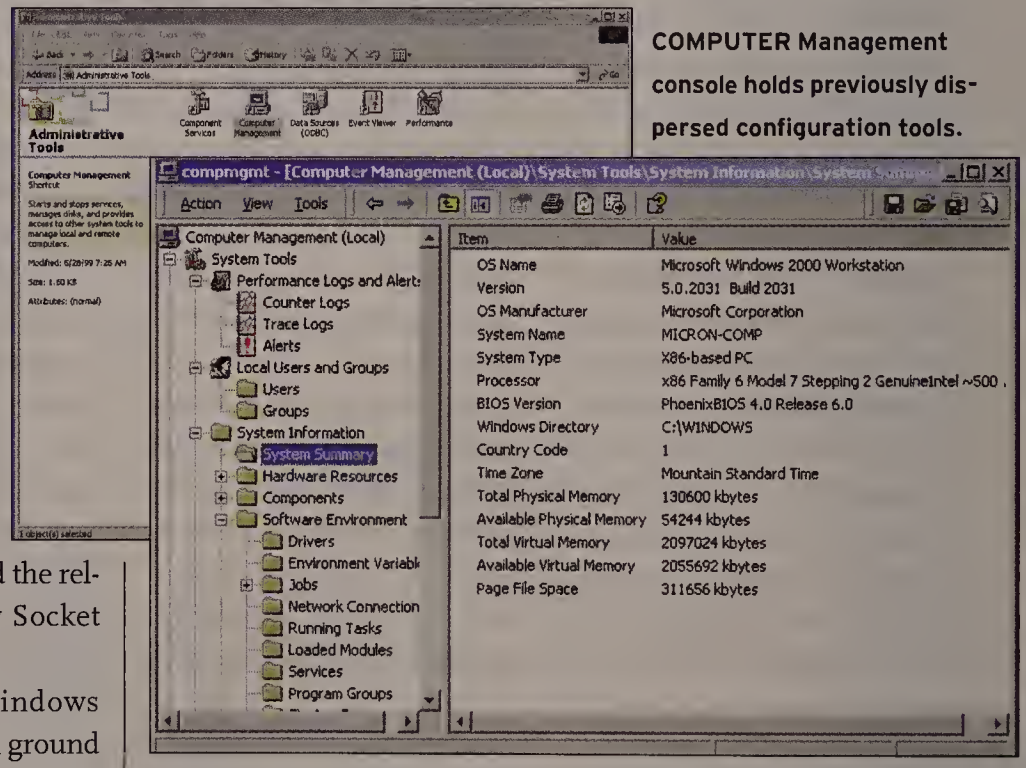
PLUG AND PRAY

WINDOWS 2000's Plug and Play subsystem, while much improved, isn't perfect. Plugging in a Logitech USB scanner, for example, worked just as you would expect: Windows 2000 detected the newly installed device and installed a driver for it automatically. Working with PC Cards was less idyllic. Windows 2000 correctly detected 3Com modem cards, installing a generic modem driver for each of them. But the OS stumbled over an older Megahertz 28.8-kbps modem card, ActionTec's fairly ancient ComNet combination ethernet/28.8-kbps modem card, and the relatively contemporary Socket EA Credit Card.

More seriously, Windows 2000's setup program ground to a halt when the Socket card was inserted. Even after we pulled the card out and completed installation, simply inserting the card froze Windows 2000. Removing the card brought the operating system instantly back to life. The problem appeared to stem from a conflict between the card and the Micron laptop—Windows 98 running on the same system refused to recognize the card as well. Still, a simple hardware conflict should not bring Windows 2000 to its knees.

Even when Windows 2000 recognizes your PC Card, you can't just pop the card in and out as in Windows 98. Before ejecting a card, you must first tell Windows 2000 to stop the card. Failure to do so generates a dialog box that warns of potential system instability. It's too bad Microsoft couldn't make this process smoother.

Our suggestion: Though Microsoft may iron out these wrinkles by the time Windows 2000 ships, you should still make sure your hardware devices are on Microsoft's compatibility list before you decide to upgrade. Also, contact manufacturers in advance and ask them if their peripherals will work under Windows 2000.



COMPUTER Management console holds previously dispersed configuration tools.

MILLENNIAL FORTUNE

MICROSOFT HAS targeted October for shipping Windows 2000. But as we went to press, the company (despite positive reports from Beta 3 users) still had not officially announced a ship date.

If you just can't wait until Windows 2000 ships officially, several system vendors, including Micron and Dell, will sell you a computer with Beta 3 preloaded. And for $60, Microsoft will send you a preview copy (www.microsoft.com/windows/preview/order.asp). Meanwhile, the Gartner Group research firm offers some advice: Although installing the new operating system on a few desktops here and there should be fine, companies should avoid wide-scale deployments at least until the first service pack appears.

Whenever Windows 2000 does ship, you may be tempted to take the upgrade plunge. Desktop PC users with fairly current hardware and software will probably experience few problems. However, if your system, peripherals, and software are more than a few years old, you may want to hold off. And, unless Microsoft makes huge strides this summer, notebook users will want to stick with tried-and-true Windows 98 for now—or simply wait for Microsoft's next Windows 9*x*–based operating system, due in 2000.

The Hits Just Keep on Coming as Downloadable Music Rocks the Web

ANALYSIS

IMAGINE THIS: You're on a road trip, hankering for some jazz. You pull up to an Internet-connected music-vending machine, choose a dozen or so tracks, and insert your car stereo's flash memory smart card. Two minutes and two bucks later, you drive off with a custom compilation that will play twice, then erase itself.

Welcome to the age of m-commerce, where vendors are battling to create a new world of downloadable music. The vending machine isn't ready yet, but you can already buy single tracks online and burn custom CDs, thanks to several new downloadable music technologies. The record industry is pushing new pay-to-play schemes to quell music piracy and jump-start profits. Until the standards shake out, you'll see competing formats.

FROM FREE TO FEE

MP3—THE FREE, downloadable music format that charms techno-savvy music lovers—is fueling the fight. Forrester Research estimates that nearly a terabyte (1000 gigabytes) of MP3 files is already available on the Net, and the popular Diamond Multimedia Rio MP3 player has inspired several other portable devices.

But MP3 wasn't made for business: It lacks copy protection, and many MP3 tunes are pirated CD tracks. The record industry is trying to persuade you to buy tracks, with technology that keeps you from passing them on to others.

Like MP3, the new m-commerce technologies compress music files for fast downloading while maintaining CD or near-CD quality. But they also encrypt the tracks with a digital-rights management system, which specifies how the downloaded files can be used.

For example, a song file can be encrypted to allow two free plays. For additional plays, you must visit a Web site and pay a fee, typically less than $2, to download a license key. If you e-mail the tune to friends, they also get two free plays.

A variation permits free playback for 30 days. Still another requires you to register at a Web site, providing the vendor with a marketing lead. To enable these m-commerce options, big names are pushing the new technologies. The bad news is you have to download several players; the good news is they coexist happily. Double-clicking a music file launches the right player. Here are the formats and applications competing for dominance:

- **A2b music** AT&T Labs has created a glitzy player application whose compression technology and sound quality are superior to MP3's. A modest selection of songs is available now on the site. *www.a2bmusic.com*
- **Liquid Audio** This elegant player even allows you to cut your own CDs. The company has alliances with a number of major artists and music sites. *www.liquidaudio.com*
- **RealJukebox** The RealNetworks application supports MP3 and several m-commerce formats; it also uses a database to organize song files. *www.realjukebox.com*
- **Windows Media Technologies** WMT 4.0's compression scheme from Microsoft—MS Audio—also surpasses MP3 compression. WMT 4.0 includes the Windows Media Player. Windows 2000 will include WMT 4.0; other Windows users can download the new player in beta form now, or wait till later this summer to download it in final form, according to Microsoft. *www.microsoft.com/windowsmedia*

SOUR NOTES?

UNFORTUNATELY, a number of thorny technical issues—such as how you'll transfer a copy-protected song into a portable playback device—await resolution. The recording industry's Secure Digital Music Initiative is creating guidelines; a first round is due this summer, giving vendors time before the holidays to make portable devices that support both MP3 and encrypted files.

Bandwidth is another roadblock: Even a compressed song can take 20 minutes or more to download by modem today. Until more of us have fast Net connections, m-commerce won't be a gold mine. Indeed, MP3 will remain quite popular for the next two years, says Forrester Research senior analyst Mark Hardie. But by 2003, secure music downloads will be a $1.1 billion business, he says. For now, you can enjoy trying out the new players. As for convenience, it will be hard to beat those Internet jukeboxes: You won't even need to stock your car with quarters.

—Jim Heid ▶

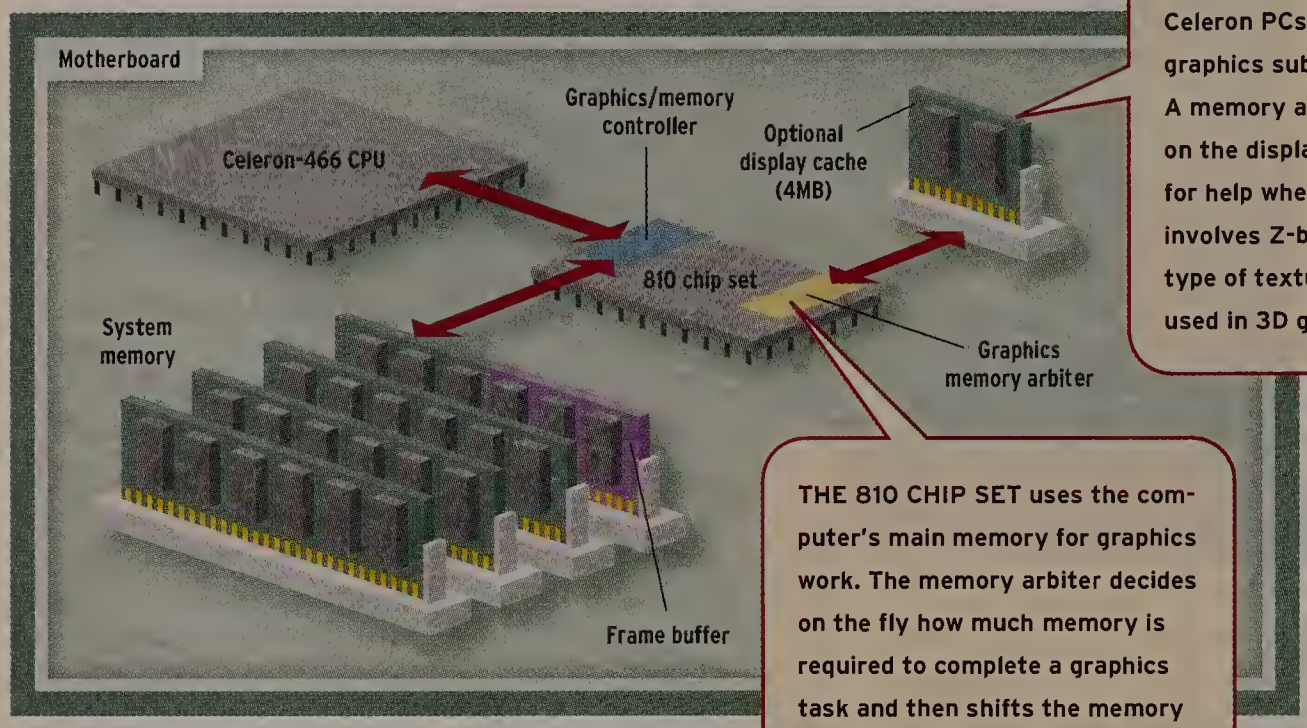
ILLUSTRATION: STEVEN LYONS

Intel Brings Splashy Graphics to Budget Desktop PCs

HARD DRIVES, CPUs, graphics cards. Those are the components that most of us think about when it's time to buy a PC. But who cares about system chip sets? You should.

By the time you read this, Celeron-based desktops from many leading vendors will contain the Intel 810, a system chip set that replaces the traditional graphics card or integrated graphics chip. The chip set, which will appear only in Celeron machines, delivers enough graphics power to satisfy many people's needs. The first Intel 810–equipped systems we've tested, Compaq's $1584 Deskpro EN C466 and Dell's $1259 Dimension L466, did as well on *PC World* graphics tests as comparable Celeron systems with an 8MB AGP card or an 8MB AGP graphics subsystem on the motherboard.

But there are trade-offs: The 810 doesn't support screen resolutions beyond 1280 by 1024, or color depth beyond 24 bits. And you can't upgrade the graphics capabilities on systems that use this chip set. For these reasons, serious 3D gamers, owners of 19-inch or larger monitors, and people who prize versatility should consider other options.



IN OUR tests, Celeron-466 PCs with Intel's new 810 system chip set and 4MB of optional display cache performed much like Celeron PCs with 8MB graphics subsystems. A memory arbiter calls on the display cache for help when a task involves Z-buffering, a type of texturing often used in 3D games.

THE 810 CHIP SET uses the computer's main memory for graphics work. The memory arbiter decides on the fly how much memory is required to complete a graphics task and then shifts the memory into a frame buffer.

MEMORY TRICKS

WHILE BUDGET-PC makers have integrated graphics, sound, and modem components onto motherboards for the past couple of years, the 810 is the first system chip set to incorporate graphics functions. It comes in three flavors. The high-end version, used in both systems we tested, contains 4MB of display cache and supports ATA66 hard drives and up to six PCI slots. The other two versions of the 810 lack display cache, and they can handle a smaller number of add-on slots; the cheapest version supports slower ATA-33 hard drives only.

The 810 chip set uses the system's main memory—64MB on both machines we tested—for almost all graphics tasks. The chip set dynamically allocates portions of main memory as needed for graphics work, in a scheme that Intel calls Direct AGP. The 4MB optional display cache is used only for an effect that is most often encountered in games. (For more details, see the illustration above.)

Still, we expect almost all U.S. vendors to use the high-end version of the 810 with the display cache. The added expense is minimal—and one vendor, speaking confidentially, said its internal tests indicate that 810 systems perform 25 to 30 percent slower on graphics tasks without the display cache.

RIGHT AT HOME

JUDGING from our tests, Celeron-466 PCs that have the 810 should please a good many budget-minded users of home systems. On our PC WorldBench 98 test suite of several business applications, the Dell and Compaq scored 200 and 203, respectively–negligibly slower than three comparison systems. And the 810 PCs caught up in the graphics test suite: In almost every test, they equaled or outperformed the comparison desktops, which had 8MB graphics subsystems from NVidia, ATI, and Matrox (see chart on page 66).

The $1259 Dell Dimension L466, configured with a 17X–40X CD-ROM drive, a 15-inch monitor, a 9.1GB hard disk, and a 56-kbps modem, packs plenty of value. (For $1399, you can upgrade to a 4.8X DVD-ROM drive and a 17-inch monitor.) But the corporate-oriented $1584 Deskpro EN C466 with a 6.4GB hard drive, a 12X–32X CD-ROM drive, an ethernet card, and a 15-inch monitor is expensive compared to other corporate Celeron-466 desktops. ▶

Deskpro EN C466
Street price: $1584; Compaq; 888/345-1518; www.compaq.com
PRODUCT INFO NO. 757

Dimension L466
Street price: $1259; Dell; 800/388-8542; www.dell.com

INFOGRAPHIC: ROBIN BRISKIN

the new PC 300GL	price	specs	everyone
	from $978* lease $49/mo†	Intel® Celeron™ processor 366 mhz / 4 slots, 4 bays / up to 64mb sdram / up to 8.4gb hdd option: ethernet and token ring adapters, option: 32 / 64 / 128mb memory dimms	The PC 300GL. It's relief for users (no more slow, old pc's). It's relief for IS staff (heavy-duty network management features). It's relief for finance (very, very affordable). Could it be all things to all people? ibm.com/ibmpc or 800 426 7255, ext. 4131

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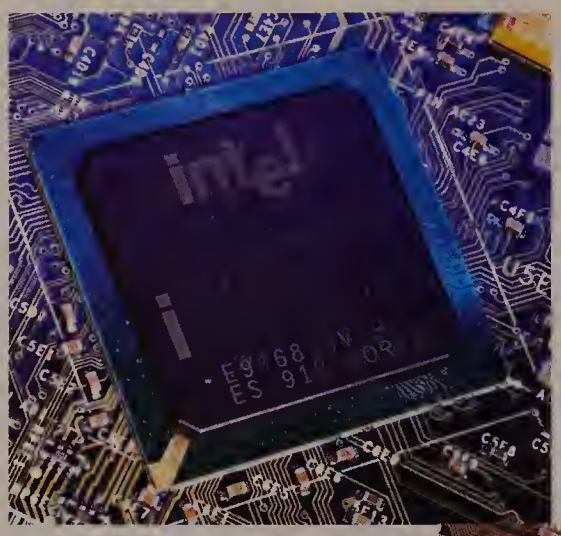
*Estimated reseller price to end users for model 6287-32U and 654102N. Actual prices may vary. Certain features described above are available for an additional charge. SystemXtra is available to credit qualified commercial, state and local government customers with valid credit for a 36-month term. †SuccessLease is offered and administered in the U.S. and Canada by Fidelity Leasing Inc., an approved provider of financing for IBM Global Financing. Monthly lease costs are provided by Fidelity Leasing and are for a 24-month term, full-payout lease, to qualified business customers only. A documentation fee and first month payment due at lease signing. Any taxes are additional. Other terms and financing structures are available. mhz denotes microprocessor internal clock speed; other factors may also affect application performance. gb=1 billion bytes for Hard Disk Drive capacity. PCs referenced in this ad include an operating system. IBM product names are trademarks of International Business Machines Corporation. Intel and the Intel Inside logo are registered trademarks and Celeron is a trademark of Intel Corporation. ©1999 IBM Corp. All rights reserved.

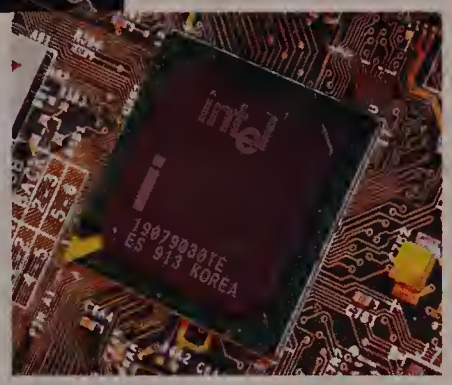
The Dell at least is priced similarly to other Celeron-466 systems with integrated, nonupgradable graphics: For example, the Micron Millennium C466 that we tested costs $1407 configured with a 4.8X DVD-ROM drive, a 17-inch monitor, a 13GB hard drive, and a 56-kbps modem.

If you are willing to live with a slower Celeron/810 system, you can save more: Dell's first new sub-$1000 PCs (as opposed to marked-down older models) are Celeron-400s with the 810 chip set, 15-inch monitors, 4.3GB hard drives, 17X–40X CD-ROM drives, and either 32MB of RAM (for $899) or 64MB of RAM (a better choice for $960).

GAMERS BEWARE

OF COURSE, these 810 systems can't match the graphics performance you'd get from a Pentium-III or AMD K6-III system with a high-end 3D graphics card. The Compaq and Dell 810 machines ably handled our Redline Racer and Incoming game tests at 640 by 480 resolution, but today's most demanding titles, such as Unreal, require more power. People with large monitors who want to set them to ultrahigh resolutions should also avoid the 810. And as noted, if you think you might someday wish to upgrade your PC's graphics, steer clear.





BECAUSE the 810 chip set sits on the PC motherboard, you can't later upgrade graphics.

In this regard, Intel's 810 chip set helps PC marketers separate their high-end PIII systems from their Celeron models. Henceforth, all Celeron systems in Dell's Dimension and Compaq's Deskpro line will use only 810 chip sets. So if you want an upgradable graphics subsystem in these lines, you must opt for a more-costly Pentium III machine.

Our advice: Before you pass up good Celeron deals, ask yourself honestly whether you're more likely to jettison your computer in two years than to upgrade it.

Once again, you'll get more for your money if you wait. The Celeron chips will only get faster, and the 810 will face more competition in the next few months.

Boards such as 3dfx's Voodoo Banshee with 16MB of memory—which handily outperformed the 810 on our graphics tests—will appear in an increasing number of Celeron systems as the year progresses, says Peter Glaskowsky, senior analyst at Cahners MicroDesign Resources. New cards will also compete with the 810, he says: "The graphics cards will get better and the 810 won't. Six months from now, the market will look different."

What's more, the 810's days as the only system chip set with integrated graphics are numbered. Scrappy Taiwanese vendor SiS, whose inexpensive components show up frequently in ultracheap PCs, plans to ship an 810 competitor—the SiS630—by the time you read this. And graphics card vendors won't relinquish their turf to Intel without a fight. ATI has plans for a system chip set with graphics instructions that will work with Pentiums, Celerons, and other processors. Consumers should benefit as Celeron systems that are already cheap and loaded continue to improve in the months ahead.

—Yardena Arar ▶

DESKTOP PCs — TEST REPORT

Affordable Celerons Serve Up Speed and Punchy Graphics

SYSTEM	CPU	Graphics RAM (MB)	Graphics subsystem	PC WorldBench 98 score	Presentation test (seconds)	Playback tests (frames per second)		
						PowerPoint 97	Director 6	Redline Racer	Incoming
Compaq Deskpro EN C466	Celeron-466	4[1]	Integrated Intel 810	203	161	94	41	46
Dell Dimension L466	Celeron-466	4[1]	Integrated Intel 810	200	157	89	42	46
Gateway GP6-466c	Celeron-466	8	Integrated ATI Rage 128	211	157	90	44	41
Micron Millennia C466	Celeron-466	8	Integrated NVidia RIVA 1282X	213	155	90	47	32
Xi 466 MTower	Celeron-466	8	Matrox Mystique G200 AGP	209	152	87	40	41
					Faster			Faster

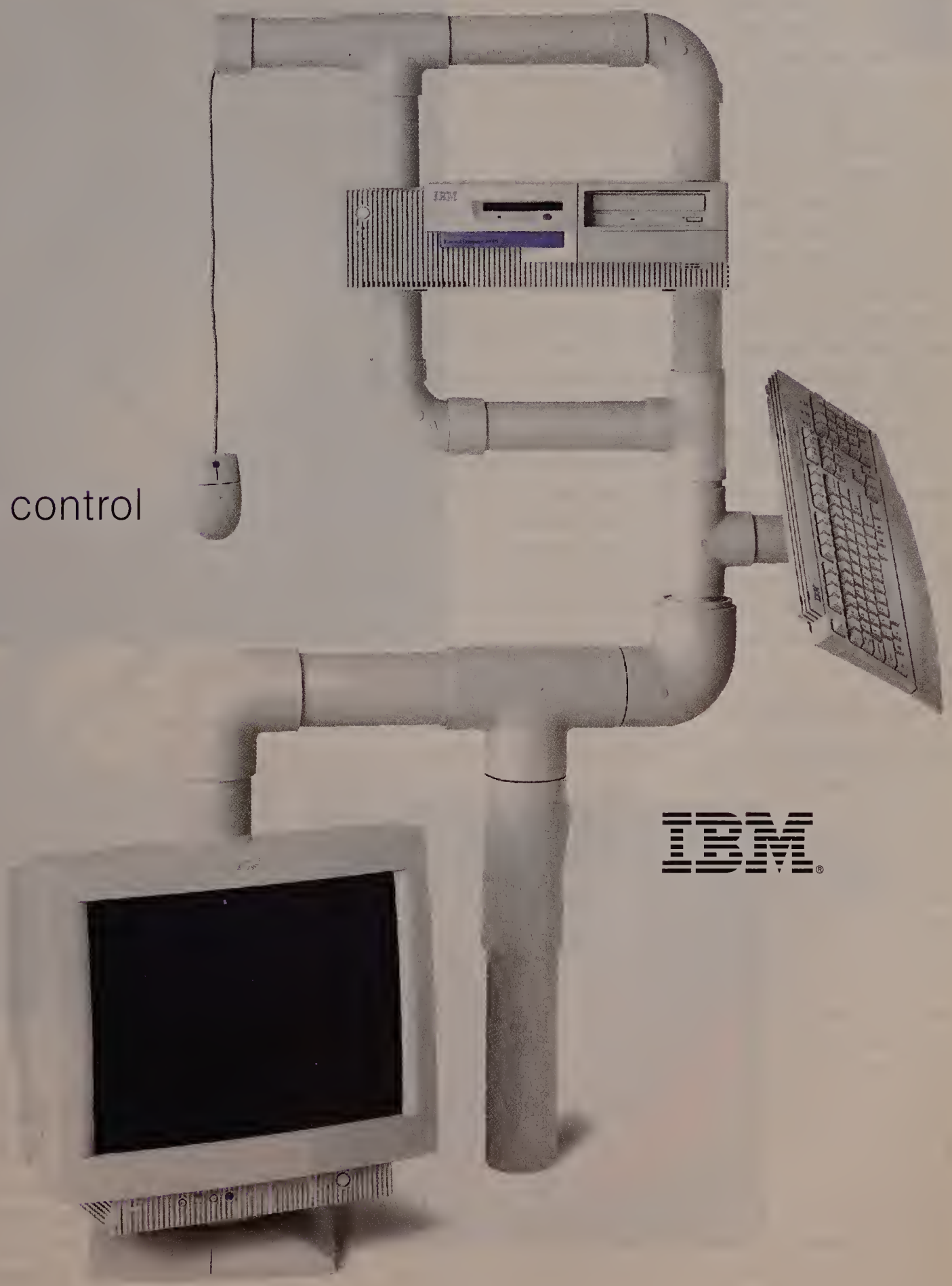
TEST PC WORLD CENTER **HOW WE TEST** All systems are tested with PC WorldBench 98, *PC World*'s application-based benchmark. A higher PC WorldBench 98 score is better. For more details on our benchmark and how we run it, see PC World Online (www.pcworld.com/testing). In Microsoft PowerPoint 97, we time a script that builds a 50-slide presentation; lower times are better. Using Microsoft Active Movie, we play back a looping AVI clip while running an animation created with Macromedia Director 6 in the foreground. We also execute self-running demos in Criterion Redline Racer and Rage Incoming. For all three playback tests, higher frame rates are better. All systems tested with 64MB of system RAM. Data based on tests designed and conducted by the PC World Test Center. All rights reserved. [1]4MB display cache supports only certain functions; system main memory utilized for graphics tasks.

PHOTOGRAPHS: BEVERLEY HARPER

	price	specs	options	control
PC 300PL	from $1,358*	Pentium® III processor (up to 550mhz) 3D AGP graphics (up to 8mb) up to 768mb memory / 20.4gb hdd integrated ethernet & audio	zip drive / cd rom 19" G96 monitor (17.9" viewable)	Imagine PCs you control from virtually anywhere – over the network or the Web. PCs that integrate easily into your enterprise management software. PCs with time-saving features like LANClient Control Manager. It's the IBM 300PL. It's the ultimate in remote control. www.ibm.com/ibmpc 1 800 426 7255, ext. 4130

e-business tools

remote control



IBM®

intel inside

pentium® III

* Estimated reseller price for model 6862-29U (CPU) and 654102N (monitor). Actual prices may vary. MHz denotes microprocessor internal clock speed; other factors may affect application performance. GB = 1 billion bytes for hard drive capacity All PCs in this ad ship with an operating system. IBM product names are registered trademarks of International Business Machines Corporation. Intel, the Intel Inside logo and Pentium are registered trademarks of Intel Corporation. © 1999 IBM Corp. All rights reserved.

Printers for $80? Check the (Not So) Fine Print

WITH COLOR ink jets finally dipping below the $100 mark, one outcome is certain: You'll be seeing them everywhere. They'll come bundled with bargain PCs, shelved next to toasters at superstores, and sold with pink glitter accents as the latest Barbie accessory. No matter where you encounter your first ultracheap printer, remember—you usually get what you pay for. With some models, you'll get even less than that.

We looked at three inexpensive new ink jets from top manufacturers: Canon's BJC-1000, Lexmark's Z11, and an Apollo P-1200 from a wholly-owned subsidiary of Hewlett-Packard. Only one of the three is clearly worth your money: the Lexmark.

LEXMARK Z11: A solid deal for an ultracheap printer.

UPS AND DOWNS

PRINTER PRICES have been dropping steadily for some time. A home ink jet cost more than $200 on average six months ago; today, that figure is closer to $175, and several sub-$150 models, such as the Lexmark 3200 Color Jetprinter, have cracked our Top 10 Printers. But now the ultracheap models break new ground: You'll pay merely $79 for the Canon or Apollo, just $119 for the Lexmark Z11—and rebates knock an additional $30 off both the Canon and the Lexmark. Two more pluses for these cheapies: They're small, and they're simple to set up.

But to keep the prices so low, manufacturers cut corners. All these bargain products (and most others) hold only one ink cartridge at a time, either black or color. So you must switch between them for the best results on documents that contain both text and color. If you print only text, you can use the black cartridge and get sharp black letters. But if you need color now and then, it's more convenient to use the color cartridge for mixed text and graphics. The result is often muddy print quality. To create a convincing black, a color cartridge needs a precise mix of colors—*composite black*—usually beyond the capabilities of most cheap printers. Slightly more expensive products, such as Lexmark's 3200 Color Jetprinter, hold both cartridges at the same time, so text always prints in true black.

APOLLO P-1200: Sizzle, but no steak

Some bargain-basement printers employ technology predating the Clinton era. The Apollo uses HP ink jet technology from 1991; Canon introduced the engine in the BJC-1000 a year later. Ink jets have improved since then, and the quality you get from those models is middling at best. But the Lexmark Z11, with its 1997 technology and its remarkably dark composite black, can produce output rivaling that of the much costlier dual-cartridge printers.

To their credit, all three low-priced models run just as fast as most home ink jets, producing a little over 2 text pages per minute, and a graphics page in about 3 minutes. If speed matters to you, expect to pay $250 or more for a printer that can crank out text and graphics pages twice as fast.

But cheap printers also skimp on features. Spend $50 to $100 additional, and you can get a dual-cartridge printer that holds more paper, lets you print on a wider range of paper types, has a more advanced driver (with options like poster printing), and may even be networkable.

BARGAIN PRINTER BAKE-OFF

LEXMARK TAKES the value lead with its Z11. For $119 ($89 after rebate), the printer gives you appealing print quality, sturdy design, and helpful documentation. Its color cartridge prints composite black text that looks truly black, ▶

PHOTOGRAPHS: BEVERLEY HARPER

ThinkPad® 570
IBM®
the new thinkpad 570.(dramatization)
transformer
This is how it works. Slip the ultralight, superthin ThinkPad 570 into an UltraBase and it transforms into an all-in-one desktop ready for the office or the road. ibm.com/thinkpad 800 426 7255, ext. 4203
ultrabase
holds floppy drive or extra battery and options like CD, DVD, Zip, extra hard drive,[3] or SuperDisk LS-120
notebook
1" thin[2] / 4.0 lbs[2] / 12.1" or 13.3" active matrix display
4.0gb or 6.4gb hard drive / 64–192mb sdram
mobile Pentium® II processor 300PE / 333 / 366 mhz
price
from $2,699[1]
e-business tools
intel inside pentium® II PROCESSOR
[1]Estimated reseller price for model 570/2AU. Price excludes UltraBase and other options. FDD/battery included. Actual prices may vary. [2]Actual weight/thinness may vary due to vendor components, manufacturing process and options. Weight includes battery; excludes FDD and other options. [3]Adapter required. mhz denotes microprocessor internal clock speed only; other factors may also affect application performance. gb=1 billion bytes for HDD capacity. PCs referred to in this ad include an operating system. IBM product names are trademarks of International Business Machines Corporation. The Intel Inside logo and Pentium are registered trademarks of Intel Corporation. © 1999 IBM Corp. All rights reserved.

and photographs shine with impressively realistic colors and sharp details.

In its default mode (the way most pages get printed), the Z11's 600-by-600-dpi resolution compares with that of printers selling for $50 more. But at 1200 by 1200 dpi—among the highest resolutions you can get with any printer—the Lexmark's images rival those from upscale models.

STRONG, SILENT TYPE

AT 14.7 INCHES wide by 8.4 inches deep by 6.1 inches high, the Lexmark Z11 is larger than the Canon and about the same size as the Apollo. (The three units weigh between 4 and 7 pounds each.) The Z11 is also sturdier and quieter than the other two printers and holds twice as much paper—100 sheets. Lexmark's clear documentation should make setup easy.

Meanwhile, Canon's BJC-1000, which will sell for $79 as of July 12 ($49 after rebate), comes in a solid second. The new model replaces the popular BJC-250; the only difference between the two is the case.

With no output tray, the BJC-1000's printed pages spill onto the floor. It also lacks both an LED light, so you can't tell whether it's on, and an on/off button, so it stays on all the time once it's plugged in. Yet the Canon excels with other, more important attributes, notably its tiny size (14 inches wide, 6.4 inches high, and 7 inches deep) and clear documentation. Its output is paler and less distinct than the Lexmark's but far more impressive than the Apollo's. Its readable text and distinct graphics will do fine for most users, and both improve on coated or glossy paper.

HP LITE

THE APOLLO P-1200 uses a Hewlett-Packard engine and HP inks, and the phrase "powered by Hewlett-Packard inkjet technology" is stamped on its case and on its packaging. The only unfamiliar elements are the new software driver and case design. Apollo, however, is aiming at a market demanding affordability and style rather than HP's core values of reliability, quality, and performance.

The $79 P-1200 printer—Apollo's first offering—looks swank but lacks substance. Its chic blue plastic accents, fold-up paper tray, and pyramid shape stand out among the gray boxes. But its print quality is lousy. Composite black carries a blue cast, and photos look washed out and gritty, regardless of the paper they're printed on. Mohan Garde, general manager of Apollo, believes that the company's P-1200 meets a "threshold" level of quality—as long as you don't want photos. "People shopping at the ultralow end of the market want basic functionality," says Garde. "If they are driven by printing photographs, Apollo is probably the wrong printer for them."

But on top of its poor image quality, the P-1200 might baffle novice users. It includes no printed manual, its quick-start guide is confusing, and its on-screen help refers to HP printers. (The Apollo Web site does offer clear illustrations.)

The Apollo's different configurations—and their price structure—get perplexing, too. A P-1250i model, identical to the P-1200 except for its added greeting-card and Internet printing software, costs $109 (minus a $30 rebate if you buy it alone, or minus $40 if you buy it with a PC). The P-1220, a new model aimed at—we swear—Barbie enthusiasts, costs the same as the P-1250i (including the rebate structure), but it includes glitter pink accents, Barbie decals, and the Magic Hair Styler CD-ROM. Go figure.

Apollo P-1200
$79 street; Apollo Consumer Products; 888/427-6556; www.myapollo.com
PRODUCT INFO NO. 754

Canon BJC-1000
$79 street; Canon Computer Systems; 800/652-2666; www.ccsi.canon.com
PRODUCT INFO NO. 755

Lexmark Z11
$119 street; Lexmark Int'l; 800/539-6275; www.lexmark.com
PRODUCT INFO NO. 756

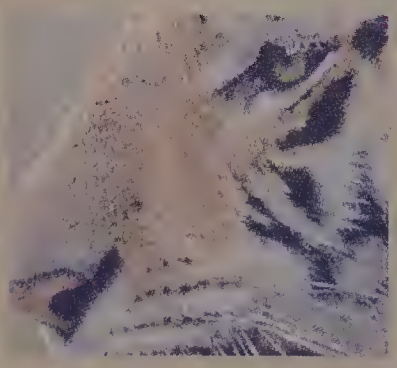
LOWDOWN

IF YOU'RE searching for the cheapest printer around and can live with middling print quality, consider the Canon. Better yet, fork over another $40 for the Lexmark, which will reward you with far superior text and images. And if you can pay still more—at least $150 total—and want more-convenient printing, spring for a dual-cartridge model like the Lexmark 3200 Color Jetprinter. Whether you're comparing two PC-printer bundles or selecting an ink jet to go with your second or third system, don't sacrifice quality for good looks. —*Karen Silver* ▶

Battle of the Bargains

THE GOOD
Lexmark Z11: Realistic colors, sharp detail throughout, and rich, dark blacks.

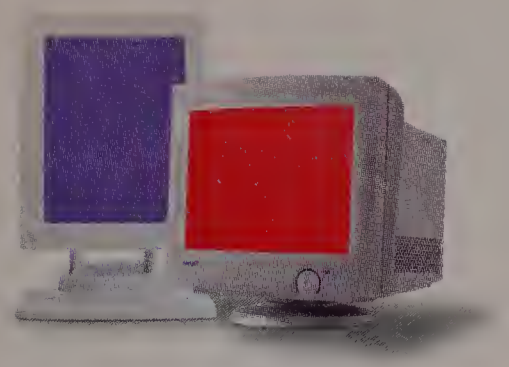
THE AVERAGE
Canon BJC-1000: Colors look vivid but a bit garish; clarity is better than the Apollo's.



THE UGLY
Apollo P-1200: Washed-out colors, weak black, and fuzziness that obscures details.

THE BENCHMARK
Lexmark 3200 Color Jetprinter: Bright yet subtle colors, smooth letters with no jagged edges.

LOOK AGAIN.



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Elegant Palm VII, Tasty BlackBerry Pager Lead New Wave of Wireless Gadgets

A NEW generation of wireless products may finally deliver what vendors have long promised—a pocket-size device that lets you easily retrieve e-mail and view Web data from anywhere. We tested shipping models of the best miniature units to date: 3Com's Palm VII, which is the latest iteration of the popular Palm organizer; and BlackBerry, a souped-up alphanumeric pager from Research In Motion. The products improve hugely on their predecessors.

But these gadgets are not yet ready to join the cell phone as ubiquitous business tools. Their e-mail and Web access features are usable but limited, their wireless coverage is spotty outside major cities, and associated service charges are steep. Cell-phone jockeys may want to hold out for one of the new and improved Internet-enabled phones expected to ship later this year.

RIM'S BLACKBERRY two-way pager (left) and 3Com's Palm VII personal digital assistant keep you in touch.

PALM CUTS THE CORD

THE $599 PALM VII is already available in the New York area and due for national rollout this fall. Like earlier Palm units, the Palm VII is a well-designed pocket organizer with pen input, a calendar, an address book, and other PIM features, plus slick data synchronization with a desktop computer. But this Palm also has a radio modem and pop-up antenna. Step through a quick sign-up wizard for 3Com's Palm.Net Internet service, designed for this device, and you're ready for unplugged e-mail and Web access.

These features, however, scarcely resemble those of their PC counterparts. Though the VII's IMessenger e-mail handles short messages well, it works only with your Palm.Net account, not with corporate or ISP e-mail. You must download incoming messages exceeding 500 characters (roughly 75 words) in chunks, and IMessenger doesn't handle file attachments at all. The 11-line screen can display 40 to 50 words of a message.

Another limitation: You cannot browse the Web at large. Instead, 3Com has partnered with dozens of big Web brand names such as ABC News, the Wall Street Journal, and Yahoo to provide bite-size chunks of information tailored to the Palm VII's small screen and its slow (8-kilobits-per-second) wireless connection. News, stock quotes, and travel information are all available now, with more content on the way. The initial services are handy but basic.

Like its Palm ancestors, the VII is elegant, innovative, and useful. But at $599, it costs nearly twice as much as the more mundane Palm IIIx.

COSTLY COVERAGE

THE STANDARD $10 monthly plan gets you 50KB of transmissions (approximately 150 screens' worth of e-mail or Web content). 3Com believes that most users will prefer to use the $25 premium monthly service, which covers 150KB (about 450 screens) of data. With either plan, you pay 30 cents per kilobyte once you've exhausted your initial allotment—a likely eventuality if you become a Palm VII addict.

In tests conducted in the Boston area, we obtained consistently trouble-free connections to the Palm.Net service indoors, outdoors, and in the car. Still, the service doesn't exactly blanket the nation: Although the BellSouth data network it runs on is available in 260 U.S. cities, the strength of the signal varies. If your work takes you far into the bush, you'll probably lose contact, and entire states—including Alaska, and Montana, and Wyoming—have no service (see www.palm.net/coverage). ▶

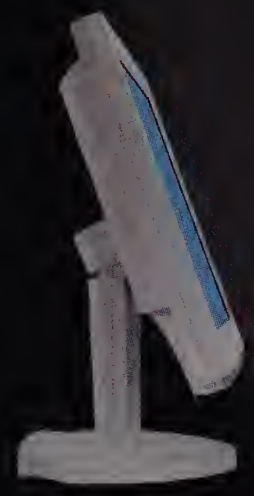
Two Ways to Go Wireless: PDA versus Pager

	LEADING CONTENDER	List price/ monthly cost	Attributes	What's next	Product info number
PDA	3Com Palm VII 800/881-7256 www.palm.com	$599/$25 [1]	Large screen, pen input; easy to use; good PIM and PC synchronization features; lots of software.	Windows CE-based products from various vendors.	771
Pager	Research In Motion BlackBerry 877/255-2377 www.blackberry.net	$399/$50 [2]	Smallest and lightest device, QWERTY keyboard, integration with Exchange mail, always on.	New model of Motorola's competing PageWriter due soon.	772

[1] For 150KB of e-mail and Web services.

[2] For unlimited e-mail and limited Web services; does not include $20-per-month rebate for first year of service.

PHOTOGRAPH: BEVERLEY HARPER



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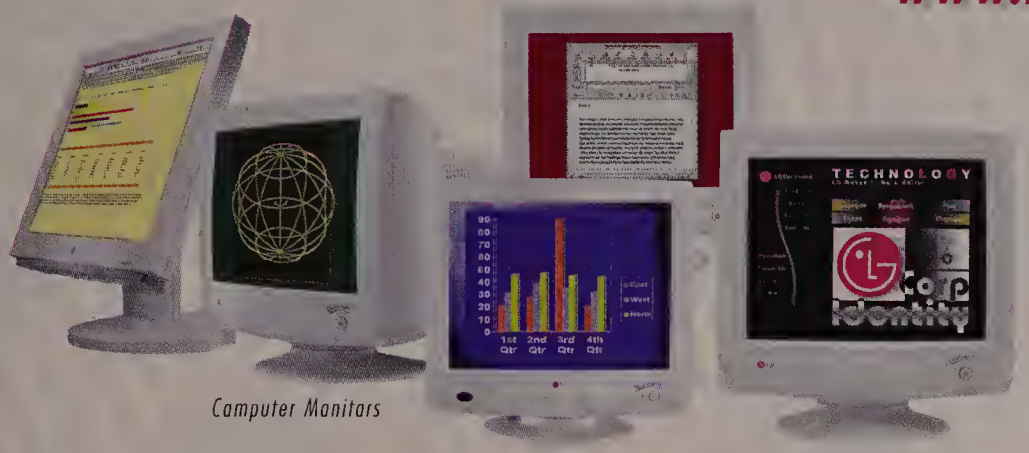

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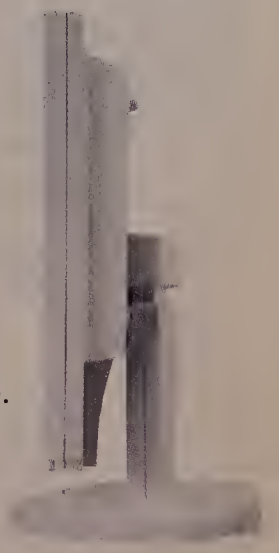

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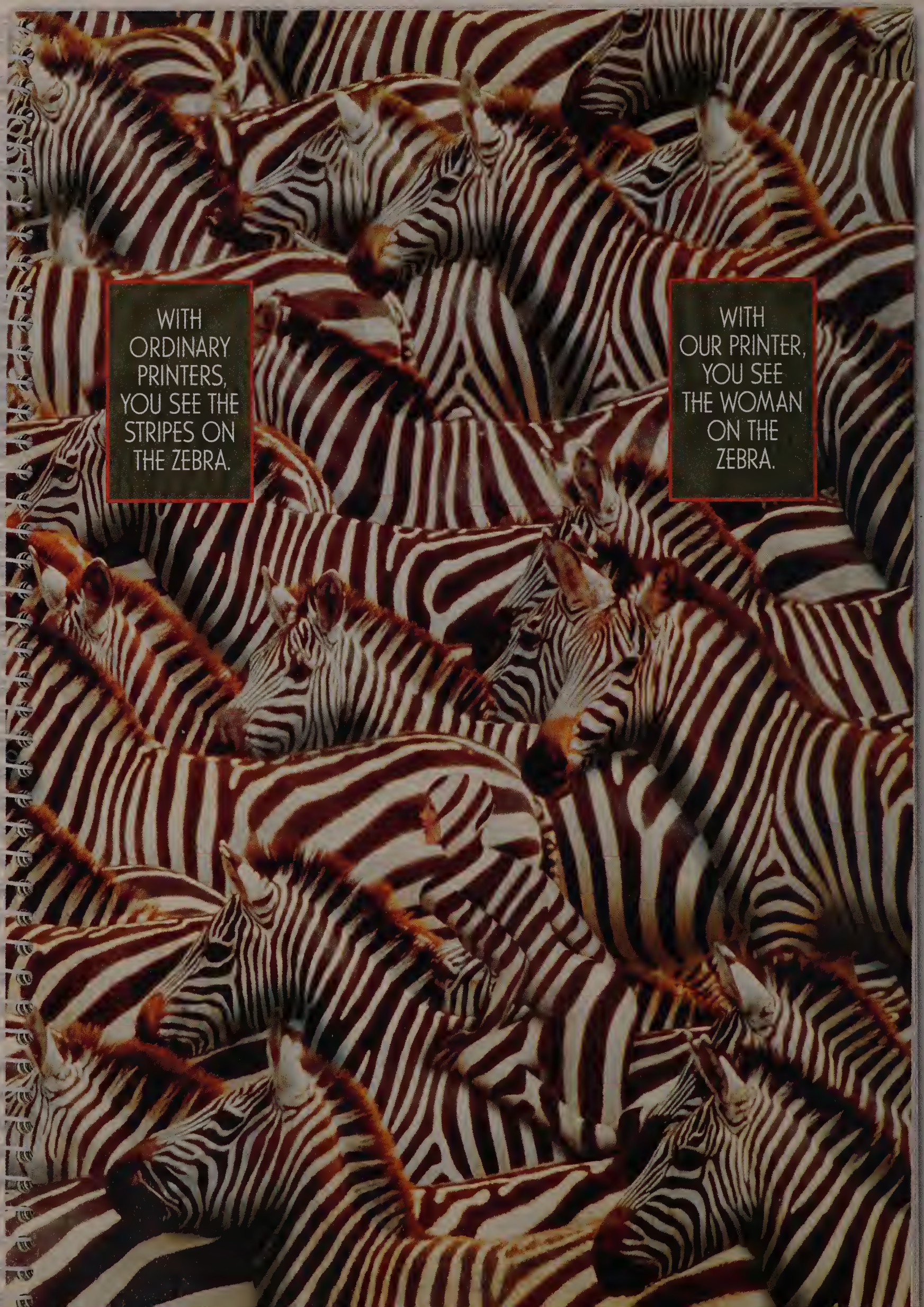
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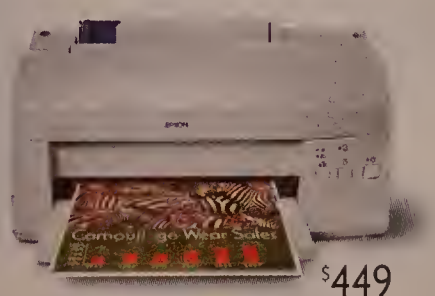

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PAGER ON STEROIDS

THE PALM VII'S most intriguing rival at the moment is RIM's BlackBerry, a $399 device that blurs the distinctions between a pager and a PDA. Only slightly chunkier than a typical pager, the BlackBerry offers e-mail and a calendar and address book that synchronize with a desktop PC. The device is designed to work with your e-mail account on a Microsoft Exchange e-mail system—period. It doesn't work with Lotus Notes or ISP-based POP3 e-mail. For $40 a month, you get unlimited wireless e-mail on the same BellSouth network the Palm VII uses, but this price doesn't include Web access. We tested the BlackBerry on Go.Web, a third-party service that provides unlimited news, weather, driving directions, and other services for $10 per month.

> These two new products go a long way toward making the promise of wireless computing a reality.

The RIM BlackBerry's tiny QWERTY keyboard works well for short messages (you type with your thumbs). Because it's a pager at heart, the device can beep or vibrate when new e-mail arrives. In contrast, the Palm makes you download e-mail manually.

But the BlackBerry doesn't handle lengthy e-mail any better than the Palm VII—its smaller screen transforms even medium-length messages into marathon scrolling exercises. And though the unit lets you send and receive e-mail through your Exchange account, there is a complication: Unless your company buys and installs RIM's server-side software (prices start at $2999), you must leave your PC running with RIM's e-mail redirection utility at all times to send and receive e-mail on the BlackBerry. Even if you don't see that as a security risk, a system crash could lock the BlackBerry out of your in-box.

So which wireless device should you choose? Go with the gadget you know. If you currently use a Palm product, consider the Palm VII. If you like your pager, pick the BlackBerry. If you can't live without your phone, hold out for a smart phone. Although no single device will always satisfy everybody, these new products go a long way toward making the promise of wireless computing a reality.

—Harry McCracken

400-MHz Notebooks: Go for Celeron, Pass on PII

THE NUMBER 400 can mean different things in different contexts. As a career home run mark, it's great. As an SAT score for your college-bound kid, it's far from ideal. And as the clock speed of Intel's newest mobile processors, it can go either way.

Here's why. We examined two of the first notebooks packing Intel's new 400-MHz Pentium II processor, and one equipped with its new 400-MHz Celeron chip. The two PII-400s—NEC's Versa SX and Compaq's Prosignia Notebook 165—are little faster than the average PII-366 notebook we've tested, yet they cost $300 to $500 more. Our advice? If you're in the market for a fast, top-of-the-line portable and you can wait a little while longer, keep an eye out for notebooks based on even faster chips due later this year.

Intel's new Celeron-400 processor is a different story. The one notebook we tested using this chip, Micron's TransPort Trek2, performed like a Pentium II-366—but it costs $2499, about $200 less than Micron's similarly configured PII-366 Trek2. You may be able to find comparable deals on Celeron-400 notebooks from other vendors, thanks to Intel's marketing of the Celeron processor as a budget alternative.

BEHIND THE NUMBERS

ONE VERSION OF the mobile PII-400 will be the first mobile x86 chip built with a manufacturing process that creates transistor elements .18 micron thick. Others will be built with a larger, .25-micron manu- ▶

A PAIR OF PII-400s and a Celeron-400 (from left): NEC Versa SX, Compaq Prosignia Notebook 165, Micron TransPort Trek2.

PHOTOGRAPH: BEVERLEY HARPER

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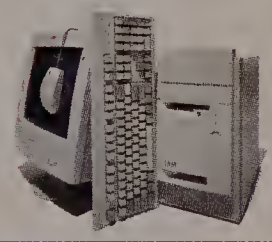

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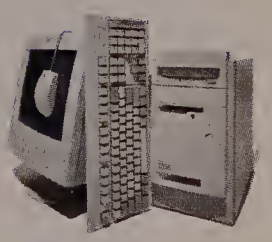

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NOTEBOOKS TEST REPORT

Celeron System Offers Solid Value

SYSTEM [1]	CPU	Level 2 cache (KB)	PC WorldBench 98 score
NEC Versa SX	Pentium II-400	256	192
Micron TransPort Trek2	Celeron-400	128	184
Compaq Prosignia Notebook 165	Pentium II-400	256	183
Average of 11 notebooks	Pentium II-366	256	186

TEST PC WORLD CENTER **HOW WE TEST** All systems are tested with PC WorldBench 98, *PC World*'s application-based benchmark. A higher PC WorldBench 98 score is better. For more details on our benchmark and how we run it, see www.pcworld.com/testing. Data based on testing conducted by the PC World Test Center. All rights reserved. [1]All systems include 64MB of RAM. Listed from fastest to slowest.

facturing process. The more compact .18-micron CPUs should consume less power and generate less heat. Still, many PII-400 notebooks, such as the two we tested, will include the .25-micron chips. In our tests, these notebooks, equipped with a 14.1-inch screen, lasted between 2 and 2.5 hours on one battery charge, a battery life we consider at the low end of acceptable.

This lower-power technology is expected to play an increasingly important role in the upcoming generation of Pentium III notebooks due by year-end. The .18-micron manufacturing process will enable PIII notebooks to offer the same 2 to 3 hours of battery life as current PII notebooks, according to Intel spokesperson Manny Vara. Celeron processors will move to the .18-micron process in the year 2000, according to Vara.

But processors are only part of the story. Of the two PII-400s we looked at, NEC's $3799 Versa SX was thinner, lighter, faster, and more expensive. You pay a premium for its unique combination of a 1.3-inch-thick case, 4.8-pound overall weight, and a modular bay capable of holding a range of add-in options. It's also the only portable of the three to include a DVD-ROM drive. But while the Versa SX outperformed the Prosignia Notebook 165, its PC WorldBench 98 score of 192 is only 3 percent better than the average score of Pentium II-366 notebooks with 64MB of RAM; and the Versa holds less than a 1 percent edge over the speediest PII-366 on record, Dell's Inspiron 7000 A366LT. These increases fall substantially below the 10 percent threshold necessary to produce a detectable difference in everyday applications.

Future developments will let notebooks operate at **600 MHz** when plugged into an **electrical outlet.**

Compaq's Prosignia Notebook 165, which is positioned as a desktop replacement, performed a shade below the PII-366 average, with a PC WorldBench 98 score of 183. Compaq confirmed that some of the preloaded programs could have hampered performance and contributed to the system's low score (the bundle included special system management software). At $2699, this PII-400 is not especially expensive considering the feature set it offers, but you could save a little money by opting for its PII-366 sibling.

The Cadillac of desktop replacements, the 8.4-pound Prosignia Notebook 165 offers a polished, convenient all-in-one design for people who need a presentation machine with the best built-in notebook audio available. It also holds many of the same types of add-ins as the NEC Versa SX.

Micron's TransPort Trek2, the only Celeron-400 that we tested, is a reasonably priced desktop replacement with plenty of multimedia delights. At only $2499, it's the least expensive of the three notebooks we looked at, yet it earned a very respectable PC WorldBench 98 score of 184 and comes with two pointing devices and an LS-120 drive. The Trek2 is easily the heaviest notebook in this clutch, weighing more than 9 pounds with the AC adapter included. But for the price, you can't beat it, especially when you compare it to an identically configured Pentium II-366. In our battery tests, the Trek2 lasted a little more than 2.5 hours on a single charge—satisfactory longevity at this chip speed.

ADDING IT UP

IF YOU'RE looking for a good deal right now on a fast notebook, consider a portable with a Celeron-400 CPU. If you can wait, you'll be able to select a notebook equipped with a new chip from Intel rival AMD, the K6-III-P-380, which should be widely available in midsummer. These portables should be almost as fast as PII-400 notebooks but cost a couple of hundred dollars less, says Linley Gwennap, editorial director with Cahners MicroDesign Resources in Sunnyvale, California.

600-MHz HOLIDAYS

IF YOU NEED something significantly faster than today's notebooks, you'll have to wait until December, when the next big jump in notebook processor speed is due. At that time, you'll see notebooks equipped with the long-awaited mobile Pentium III and a new chip set.

These developments will allow notebooks to graduate from today's 66-MHz bus to one that runs at 100 MHz. Further, when plugged into an electrical outlet, these notebooks will operate at 600 MHz—matching the speed of the fastest PC desktops for the first time in years—and when using a battery, they will run at 500 MHz. Now those are numbers worth waiting for.

—*Carla Thornton* ■

Compaq Prosignia Notebook 165
Street price: $2699; Compaq; 800/345-1518; www.compaq.com
PRODUCT INFO NO. 768

Micron TransPort Trek2
Street price: $2499; Micron; 888/208-1937; www.micronpc.com
PRODUCT INFO NO. 769

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- SoundBlaster AudioPCI 64D
- GCS-200 Speakers by Cambridge SoundWorks
- 56K[3] Internet/Fax Modem
- **Canon Color Printer**
- Microsoft Windows 98
- MS® Works Suite 99 Software
- **1-Year gateway.net Internet Access[1]**

$1499 or as low as **$42**/mo. for 48 mos. through our Your:)Ware program*

Upgrade to an EV910 19" Monitor (18" viewable) – $130

Upgrade to a **Boston Acoustics®** 3-Piece Speaker System – $30

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PROCESSOR

All Gateway Essential PCs include:

- 3.5" Diskette Drive
- Keyboard, Mouse
- Year 2000 Compliance[4]
- 1-Year Parts & Labor Limited Warranty / 1-Year On-site Warranty Service**

Get in touch with us for more information, and for the most current pricing.

CALL 1.800.216.3340

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Connect with us.

Gateway's Solutions
and Your:)Ware℠ Program:

Choose any Gateway Essential or Gateway Performance PC, and you can customize it with the following solution packages. We test out software titles and accessories to find the best products out there, and package them for better value.

KidBuilder '99 Preschool-Kindergarten

- CTW/Sesame Street®: Toddlers Deluxe
- Reader Rabbit's® Kindergarten
- Dr. Seuss Preschool
- Schoolhouse Rock® Thinking Games
- CTW/Sesame Street: Elmo's Preschool Deluxe
- Dr. Seuss: The Cat in the Hat
- Reader Rabbit's Reading

$99

KidBuilder '99 Grades 1-4

- Reader Rabbit's 1st Grade
- Super Solvers® Mission T.H.I.N.K.™
- The ClueFinders™: 4th Grade Adventures
- Reader Rabbit's Math Ages 6-9
- Arthur's™ Computer Adventure
- Schoolhouse Rock®: Grammar Rock®
- Madeline™ Thinking Games Deluxe

$99

KidBuilder '99 Grades 5-8

- The Oregon Trail® 3rd Edition – Pioneer Adventures
- The Princeton Review Algebra 1
- Compton's® 3D World Atlas Deluxe™
- BodyWorks® 6.0
- Super Solvers Reading Ages 9-12
- Where in the World is Carmen Sandiego?® Deluxe Edition

$99

Kids' Summer Special

One of the KidBuilder '99 packages listed above, plus:

- Kid's BackPack™
  - Lego® Island, Sonic™ 3D Blast™, Animaniacs™, Carmen Sandiego Word Detective™, Sonic & Knuckles™ Collection

$129

Gateway Total Travel Package

- Rand McNally TripMaker™ Deluxe 1999 Edition
- Rand McNally StreetFinder™ Deluxe
- Rand McNally wire-bound Road Atlas & Travel Guide
- Mindscape's® World Atlas & Almanac
- 1-year prepaid basic membership to AAA*** (for Gateway clients who are already AAA members, the monies would be applied to renewal)

$129 ($199 with Global Positioning Satellite)

Family Entertainment Package

- SketchBoard™ Drawing Tablet
- Hasbro Interactive™ Classic Games
- Pictionary,® Boggle,® Scrabble,® Sorry!,® Ultimate Yahtzee,® Clue®: Murder at Boddy Mansion, The Game of Life®

$149 ($119 after $30 SketchBoard mail-in rebate)

Additional Upgrades

- Visioneer™ OneTouch™ 7600 USB Scanner **$149**
- **100MB Iomega® ZIP BUILT-IN™ Internal Drive w/1 ZIP Disk $79**

What is the Your:)Ware℠ program and why is it for you? Your:)Ware is our way of helping you personalize your order in every way. First, choose a model from any of our lines of PCs. Then add on any peripherals, accessories or solution packages (like the ones above) to get exactly the right computer. Then we'll help you decide which service option and financing plan are best for you. And finally, you can trade in your Gateway PC toward the purchase of a new one after two years.* The Your:)Ware program is how we get your computer to fit you perfectly.

Check out SpotShop.com℠ and choose from over 30,000 hardware accessories and software titles.

Ad Code # 000146

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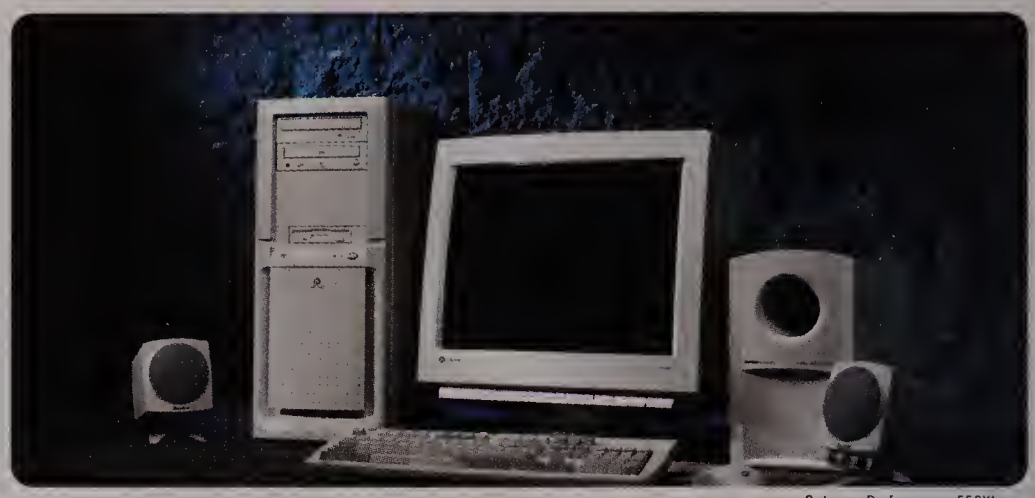

Gateway Performance 550XL

The Gateway™ Performance Line:
serious computers with serious components.

Looking for a PC that's not fooling around? One with blazing processor speeds that's tricked out with the highest-end components? Bring on the Gateway Performance PCs—our line of top-tier machines. With the latest processor technology, lots of room to expand and intense multimedia prowess, they're dialed up to power-user levels. Pick a model, and we'll customize it the way you want.

Gateway™ Performance 450	Gateway Performance 500	Gateway Performance 550	Gateway Performance 550XL
Intel® **Pentium® III** Processor 450MHz with 512K Cache	Intel **Pentium III** Processor 500MHz with 512K Cache	Intel **Pentium III** Processor 550MHz with 512K Cache	Intel® **Pentium® III Xeon™** Processor 550MHz with 512K Cache.
128MB SDRAM	128MB SDRAM	128MB SDRAM	128MB SDRAM
EV700 .28 Screen Pitch 17" Monitor (15.9" viewable)	EV700 .28 Screen Pitch 17" Monitor (15.9" viewable)	VX900 .26 Screen Pitch 19" Monitor (18" viewable)	VX900 .26 Screen Pitch 19" Monitor (18" viewable)
16MB NVIDIA™ RIVA TNT™ AGP Graphics	**16MB 3Dfx® Voodoo™3 3000G AGP Graphics**	**32MB** NVIDIA RIVA TNT2 AGP Graphics	**32MB** NVIDIA RIVA TNT2 **Ultra** AGP Graphics
13.5GB **Ultra ATA 66 7200 RPM** Hard Drive	13.5GB **Ultra ATA 66 7200 RPM** Hard Drive	13.5GB **Ultra ATA 66 7200 RPM** Hard Drive	TV/FM Tuner Card
6X DVD-ROM Drive & MPEG2 Decoder	6X DVD-ROM Drive & MPEG2 Decoder	6X DVD-ROM Drive & MPEG2 Decoder	22GB **Ultra ATA 66 7200 RPM** Hard Drive
SoundBlaster® AudioPCI™ 64D	SoundBlaster AudioPCI 64D	SoundBlaster AudioPCI 64D	6X DVD-ROM Drive & MPEG2 Decoder
Boston Acoustics® BA735™ Digital Speakers w/ Subwoofer	**Boston Acoustics** BA735 Digital Speakers w/ Subwoofer	**Boston Acoustics** BA735 Digital Speakers w/ Subwoofer	**Philips® CD-RW (CD-Rewritable) Drive w/Media**
3Com® U.S. Robotics® 56K[3] PCI Voice Ready WinModem®	3Com U.S. Robotics 56K[3] PCI Voice Ready WinModem®	3Com U.S. Robotics 56K[3] PCI Voice Ready WinModem®	SoundBlaster Live!Value with Digital Audio Output
8-Bay Mid-Tower Case	8-Bay Mid-Tower Case	8-Bay Mid-Tower Case	**Boston Acoustics** Digital MediaTheater™ Dolby® Digital 3-Piece Speaker System
Microsoft® Windows® 98	Microsoft Windows 98	Microsoft Windows 98	3Com U.S. Robotics 56K[3] PCI Voice Ready WinModem®
MS® Works Suite 99 Software	MS Works Suite 99 Software	MS Works Suite 99	**Intel® AnyPoint™ Home Networking Ready**
$1599 or as low as $45/mo. for 48 mos. through our Your:)Ware℠ program*	$1799 or as low as $50/mo. for 48 mos. through our Your:)Ware℠ program*	$2199 or as low as $62/mo. for 48 mos. through our Your:)Ware℠ program*	10-Bay Tower Case
Add a 100MB Iomega® ZIP BUILT-IN™ Internal Drive w/1 ZIP Disk– $79	Upgrade to a VX900 19" Monitor (18" viewable) - $230	Upgrade to a 10-Bay Tower Case - $50	Microsoft Windows 98
Upgrade to an EV910 19" Monitor (18" viewable) - $130	Upgrade to 32MB NVIDIA RIVA TNT2™ AGP Graphics - $70	Upgrade to an 18GB Hard Drive - $110	MS Office 2000 Small Business Software
			$3799 or as low as $106/mo. for 48 mos.[5] through our Your:)Ware℠ program[5]
			Add 1-Year gateway.net℠ Internet Access[1] - $129

All Gateway Performance PCs include:

- 3.5" Diskette Drive
- MultiFunction Keyboard
- Mouse
- Year 2000 Compliance[4]
- 3-Year Parts & Labor Limited Warranty / 1-Year On-site Warranty Service**

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pentium® III

Ask us for details about software training offered at our Gateway Country® stores.

Gateway's Solutions
and Upgrades: after you pick your computer, give it something to do.

Choose any Gateway Essential or Gateway Performance PC, and you can customize it with the following solution packages:

Additional Upgrades

Thrustmaster® Reflex USB™ 3-D Joystick - $49

1-Year gateway.net℠ Internet Access[1] - $129

Philips® CD-RW Recordable/ Rewritable Drive w/Media - $199

Hewlett®-Packard DeskJet® 895Cse Color Printer - $399

Olympus® D-340R Digital Camera - $399

Epson® PhotoPC® 750Z Digital Camera - $699

Web Page Creator Software

Adobe® PageMill® 3.0, Micrografx® Webtricity™ 2

$129

Hasbro Interactive™ Classic Games

Pictionary,® Boggle,® Scrabble,® Sorry!,® Ultimate Yahtzee,® Clue®: Murder at Boddy Mansion, The Game of Life®

$99

Digital Photo WorkShop Package

Convert your home or office into a digital darkroom/design studio.

(**$499** without printer)

Olympus D-340R Color Digital Camera

Epson® Stylus® Color 640 Ink Jet Printer

Epson® Photo Quality Paper

CorelDRAW™ 8 Illustration/Layout Software

$678

Electronic Photo Album Package

Everything you need to scan, store and organize a lifetime's worth of memories.

Visioneer® OneTouch™ 7600 USB Scanner

Philips CD-RW Recordable/Rewritable Drive

2 One-Time Recordable CDs, 1 Rewritable CD

CD Stomper™ Pro CD Labeler

$369

Intel® AnyPoint™ Home Networking Packages

Connect up to 10 PCs and share the Internet, using a single ISP account and one phone line.

$69 for 1 PC card (1 PC) **$138** for 2 PC cards (2 PCs)

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Gateway ALR 8200 Server / Gateway E-1200 Desktop PC / Gateway GP7-450 Desktop PC

Gateway™ for Business:

products and services to fit business both big and small.

Gateway Business Services: designed to take care of your business.

Your:)Ware℠ for Business:
for growing businesses

- A dedicated Business Account Representative providing custom solutions
- Custom-built systems after two years with Technology Refresh Business Lease°
- 24/7 business technical support, on-site limited warranty service;** network support and software training
- Full range of GP-Series desktops, Solo® portables and ALR®-Series servers
- Call to talk to a Business Account Representative, or we can arrange a meeting through your local Gateway Business Solutions℠ center

Business Assistance Center:
for small to medium businesses

Your mission-critical servers deserve mission-critical support. Gateway's Business Assistance Center provides advanced IT network services by Microsoft® Certified System Engineers, Microsoft Certified Professionals and Certified Novell® Engineers. We can assist your IT department or we can be your IT department. You choose the level of support that's best for your business.

System Management Service
(renewable annually) **$1799**

- Includes initial server configuration and setup, proactive maintenance, annual network consultation, 24/7 troubleshooting and more.

1-Year Network Operating System Support
(renewable annually) **$799**

Per Occurrence Calls **$129**

Custom Integration Services:
for multiple-unit orders

Through our Custom Integration Services (CIS) program, Gateway will customize your multiple-unit orders to meet unique company needs. Ask us for information on how CIS can help your organization save money and get up and running faster. And, of course, we take care of testing and certifications prior to delivery at your location.

- **System customization**
- **Asset tagging & labeling**
- **Software & hard drive image loading**
- **Hardware integration**

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Get in touch with us for more information, and for the most current pricing.

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1.888.251.5921	www.gateway.com	Gateway Country® Business Solutions℠ centers

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Gateway Business Products: high performance equipment with the flexibility to work the way you do.

GATEWAY PCS FOR BUSINESS

ALR® Series Servers

ALR 7200 Workgroup Server

- Intel® Pentium® II Processor 400MHz with 512K Cache (Dual Pentium II & Pentium III Processor Capable)
- 64MB PC 100 ECC SDRAM (expandable to 1GB)
- 4GB Ultra 2 SCSI 7200 RPM Hard Drive (expandable to 72GB)
- Integrated Intel 10/100 Twisted Pair Ethernet
- 13X min/32X max CD-ROM Drive & 3.5" Diskette Drive
- InforManager™ Server Management Software
- 3-Year Parts, Labor & On-site Limited Warranty**
- Year 2000 Compliant[4]

$1640
$56/mo. for 36 mos. business lease[Δ]

ALR 8200 Departmental Server

- Intel Pentium II Processor 400MHz with 512K Cache (Dual Pentium II & Pentium III Processor Capable)
- 128MB PC 100 ECC SDRAM (expandable to 1GB)
- 9GB Ultra 2 SCSI 7200 RPM Hard Drive (expandable to 72GB)
- Integrated Intel 10/100 Twisted Pair Ethernet
- 13X min/32X max CD-ROM Drive & 3.5" Diskette Drive
- InforManager Server Management Software
- 3-Year Parts, Labor & On-site Limited Warranty**
- Year 2000 Compliant[4]

$2599
$89/mo. for 36 mos. business lease[Δ]

GP-Series Small Business Desktop PCs

GP6-400c

- Intel® Celeron™ Processor 400MHz with 128K Cache
- 64MB SDRAM (expandable to 384MB)
- 4.3GB Ultra ATA Hard Drive
- EV500 15" Color Monitor (13.9" viewable)
- 8MB AGP Graphics
- 17X min/40X max CD-ROM Drive
- 10/100 Twisted Pair Ethernet
- Business Audio with Speakers
- **Microsoft® Office 2000 Small Business Software**
- MS® Windows® 95 or Windows 98

$999
$34/mo. for 36 mos. business lease[Δ]

GP7-450

- Intel® Pentium® III Processor 450MHz with 512K Cache
- 96MB SDRAM (expandable to 384MB)
- 13GB Ultra ATA Hard Drive
- EV700 17" Color Monitor (15.9" viewable)
- 16MB AGP Graphics
- 17X min/40X max CD-ROM Drive
- 10/100 Twisted Pair Ethernet
- **Iomega Internal ZIP Drive**
- Business Audio with Speakers
- **MS Office 2000 Small Business Software**
- MS Windows 95 or Windows 98

$1499
$51/mo. for 36 mos. business lease[Δ]

SOLO® Portable PCs

Solo 5150SP Road Warrior

- 14.1" TFT Color Display
- Intel Celeron Processor 333MHz
- 32MB SDRAM (expandable to 256MB)
- 4GB Ultra ATA Hard Drive (expandable to 10GB)
- Integrated CD-ROM Drive
- Integrated V.90 PC Card Modem[3] & 3Com® 10/100 Ethernet
- MS Windows 95 or Windows 98

$1899
$65/mo. for 36 mos. business lease[Δ]

Solo 9150LS Desktop Replacement

- 15" TFT Color Display
- Intel Pentium II Processor 333MHz
- 64MB SDRAM (expandable to 384MB)
- 6GB Ultra ATA Hard Drive (expandable to 14GB)
- Integrated CD-ROM Drive & 3.5" Diskette Drive
- Integrated V.90 Modem[3]
- MS Windows 95 or Windows 98
- MS Office 2000 Small Business Software

$2699
$92/mo. for 36 mos. business lease[Δ]

E Series Managed Desktop PCs

E-3200 400

- Intel Pentium II Processor 400MHz with 512K Cache
- 64MB SDRAM (expandable to 384MB)
- 8.4GB Hard Drive (expandable to 13GB)
- EV700 17" Color Monitor (15.9" viewable)
- Integrated ATI® RAGE™ PRO TURBO with 4MB
- 17X min/40X max CD-ROM Drive
- Integrated Business Audio
- Integrated 3com 10/100 Ethernet with Wake-up On LAN
- MS Windows 95 or Windows 98
- LANDesk® Client 3.31
- 3-Year Parts & Labor Limited Warranty**

$1349
$46/mo. for 36 mos. business lease[Δ]

E-4200

- Intel Pentium III Processor 500MHz with 512K Cache
- 128MB SDRAM (expandable to 384MB)
- 13GB Hard Drive (expandable to 22GB)
- VX900 19" Color Monitor (18" viewable)
- ATI RAGE 128GL AGP Graphics with 16MB
- 3Com 10/100 Ethernet with Wake-up On LAN
- MS Windows NT 4.0
- LANDesk Client 3.31
- 3-Year Parts & Labor Limited Warranty**

$1999
$68/mo. for 36 mos. business lease[Δ]

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° Technology refresh program participants, provided certain requirements are met, including credit approval, may choose to refresh their Base Unit, as defined in Lease Agreement, during the period(s) designated in the Lease Agreement. Equipment will be refreshed with the latest available model in its Product Class, as determined at Gateway's sole discretion, and will extend the lease for a term of 18 to 24 months as predetermined in the Lease Agreement and related Lease Schedule(s). Other terms and conditions apply. Leasing provided by independent leasing companies to qualified commercial customers. Lease terms subject to change without notice or obligation. Call for details. **Call 1-800-GATEWAY or write to Gateway Terms & Conditions, P.O. Box 1951, North Sioux City, SD 57049-1951 for a free copy of our limited warranties and on-site service agreements. On-site customers: If Gateway determines on-site service is necessary, it will be provided for product in the continental United States, Alaska, Hawaii, Puerto Rico and Canada (excluding mice, keyboards, docking stations, external peripherals and monitors). You may be asked to take your PC to a Gateway location for warranty service. See agreements for specific terms and limitations. Δ Leasing provided by independent leasing companies to qualified commercial customers. Lease payments based on a 36-month term. Lease terms subject to change without notice or obligation.

Gateway Solo 9150XL

Gateway™ Portable PCs:

like a desktop PC, when the desk is your lap.

Solo® 2500SE	Solo 2500LS	Solo 9150SE	Solo 9150XL
12.1" SVGA TFT Color Display	13.3" SVGA TFT Color Display	14.1" XGA TFT Color Display	15.1" XGA TFT Color Display
Intel® Celeron™ Processor 333MHz	Intel® Pentium® II Processor 333MHz	Intel Pentium II Processor 333MHz	Intel Pentium II Processor 400MHz
32MB SDRAM (expandable to 288MB)	32MB SDRAM (expandable to 288MB)	64MB SDRAM (expandable to 384MB)	256MB SDRAM (expandable to 384MB)
2MB Graphics Accelerator with 64K Colors	2MB Graphics Accelerator with 64K Colors	2X AGP 3-D ATI® RAGE™ LT PRO with 8MB SGRAM	2X AGP 3-D ATI RAGE LT PRO with 8MB SGRAM
Integrated 10X min/24X max CD-ROM Drive & 3.5" Disk Drive	Integrated DVD-II Drive & 3.5" Disk Drive	Removable Combo DVD-II Drive & 120MB SuperDisk™ Drive	Removable Combo DVD-II Drive & 120MB SuperDisk™ Drive
4GB Ultra ATA Hard Drive	4GB Ultra ATA Hard Drive	6GB Ultra ATA Hard Drive	14GB Ultra ATA Hard Drive
NiMH Battery & AC Pack	Lithium Ion Battery & AC Pack	Lithium Ion Battery & AC Pack	Two Lithium Ion Batteries & AC Pack
NTSC/PAL Video Output	NTSC/PAL Video Output	NTSC/PAL Video Input & Output	NTSC/PAL Video Input & Output
EZ Pad® Pointing Device	V.90 56K[3] Modem	Integrated V.90 56K[3] Modem	Integrated V.90 56K[3] Modem
Starting Weight: 7.1 lbs.[5]	Casual Case	Deluxe Leather Case	Deluxe Leather Case
Corel® WordPerfect® Suite 8 Software	EZ Pad Pointing Device	EZ Pad Pointing Device	EZ Pad Pointing Device
1-Year Parts & Labor Limited Warranty**	Starting Weight: 7.1 lbs.[5]	Starting Weight: 8.6 lbs.[5]	Port Replicator & External Battery Charger
$1499 or as low as $42/mo. for 48 mos. through our Your:)Ware™ program*	Microsoft® Office 2000 Small Business Software	MS® Works Suite 99 Software	Starting Weight: 8.6 lbs.[5]
	1-Year Parts & Labor Limited Warranty**	1-Year Parts, Labor Limited Warranty & On-site Service**	MS Office 2000 Small Business Software
	$2299 or as low as $64/mo. for 48 mos. through our Your:)Ware program*	$2499 or as low as $70/mo. for 48 mos. through our Your:)Ware program*	1-Year Parts, Labor Limited Warranty & On-site Service**
			$4599 or as low as $128/mo. for 48 mos. through our Your:)Ware program*

All Solo Portable PCs include:

- USB Port
- CardBus
- Zoomed Video Support
- EZ S.M.A.R.T.™ Hard Drive Monitoring Protection Service
- Integrated 16-Bit Sound & Stereo Speakers
- Microsoft® Windows® 98, LapLink® V.7.5 Protection for Windows 98
- McAfee® VirusScan
- Year 2000 Compliance[4]

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Two Great Products from Vega Technologies

VEGA technologies

The World's First (and Only)

$149 PC!

Clone Your PC

Buddy uses the power of today's PC to create a second computer as powerful as the original. Simply install the Buddy in your existing PC, add a monitor, keyboard and mouse (up to 50 ft away) and Presto! You have a second PC just as powerful as the original.

Over 50,000 Shipped

The second PC can use the same Internet connection, printer, hard drive and peripherals as the main PC. It can use all the software* on your main PC. All this at the same time and without any noticeable slowdown of either PC!

*End-user license may be required for multi-usage.

Both Users Can Independently Use	First PC	2nd PC
Word Processor	✔	✔
Spreadsheet	✔	✔
E-mail	✔	✔
Database Application	✔	✔
Graphics File	✔	✔
Game	✔	✔
CD-ROM	✔	✔
Modem	✔	✔
Internet	✔	✔

Sound not available on Second PC.

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HOME OFFICE COMPUTING

PCWEEK BEST OF COMDEX

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Key Features

- Stand-alone duplicating. No need to be connected to a PC or Mac
- Records audio, data or game CDs and more
- Easy operation using one-touch record button.
- Works as an external peripheral when connected to a PC or Mac.
- Real-time (on-the-fly) recording at 1X, 2X, 4X adjustable speed.
- Automatic CD format detection (audio, data or game, etc.).
- Compatible with Windows 3.1, 95, 98, NT, IBM OS/2 and Mac OS
- Series 1010 IDE, 1020 SCSI-II
- 10 CDs bundled. 50-CD pack available for $50.

Circle 248 on card or go to www.pcworld.com/productinfo

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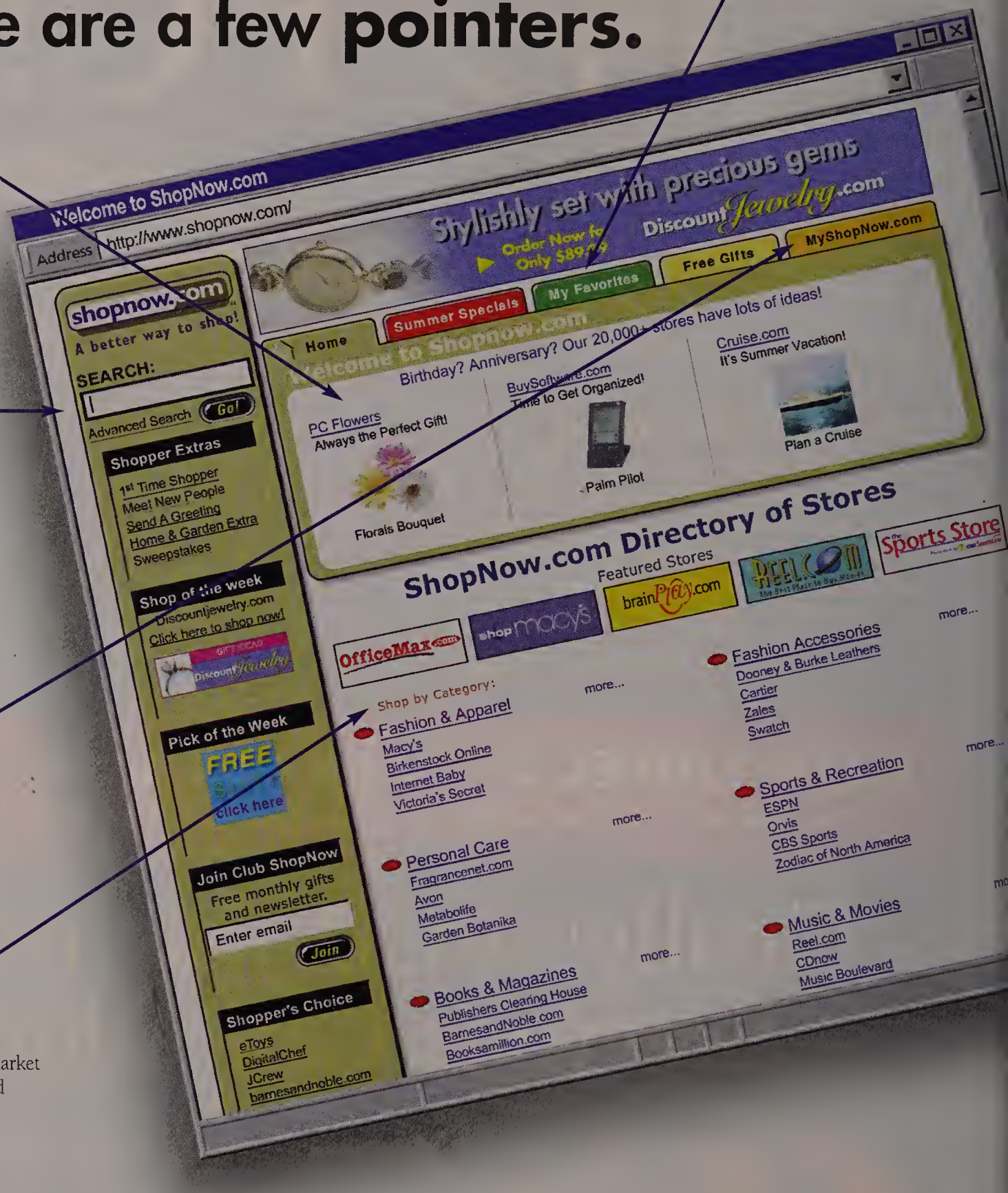

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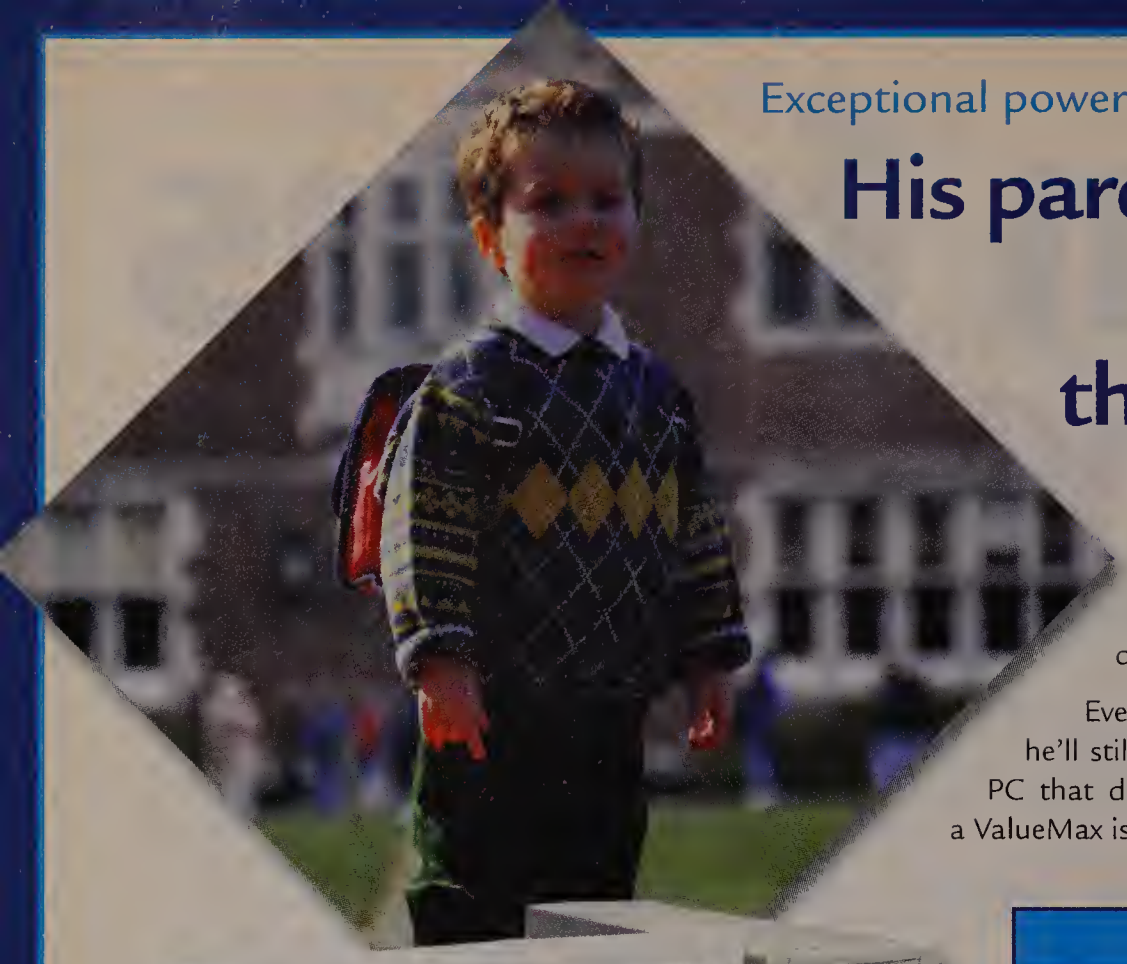

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CHANCES ARE WHEN YOU WERE IN SCHOOL THE only high-tech tool you used was a calculator. By comparison, today's students are inundated with technology.

Is all this technology in the classroom a good thing? "Technology is a powerful tool, with the ability to transform," says Don Blake, a senior technologist with the National Education Association's Teaching and Learning Unit in Washington, D.C. "It puts things in the first person and allows students and teachers to experience the reality of a subject, making for a closer relationship between the subject and what the students are learning."

While the growing use of computers in education raises some issues for both parents and teachers, overall, technology in the classroom is viewed as a big plus. And students, teachers, and parents are clearly embracing the concept.

Computers Go Back to School

"I can honestly say that by using the computer every day, my students have improved in their reading levels, stretched their minds, and increased their intellectual ability."

—Nancy Willyard, second-grade teacher, Norman A. Miller Elementary School, Cement City, Mich.

A 1998 survey by Market Data Retrieval, a Dun and Bradstreet company based in Shelton, Conn., found:

- The number of computers for instructional use in all schools doubled in the past five years, from four million in 1993 to over eight million in 1998.
- Over 85% of public schools have Internet access, an increase of 21% in the past year and a growth of 166% since 1996. Sixty-four percent of Catholic and 54% of private schools also have Internet access.

CLASSROOM IMPACT

"Technology appeals to kids – and their 'immediate, want-it-now' mode," says Jon-Paul Roden, a department chair for the Vernon, Conn., public schools' computer science department. "It also provides visual and tactile reinforcement for children with certain learning issues."

"Technology allows a higher level of thinking," adds Beth Shepley, a biology instructor and department head at Avon High School in Avon, Mass. "Students spend less time on tedious things and can spend more time on analysis."

Reed Hundt, a partner with New York-based McKinsey & Co., and former commissioner of the Federal Communications Commission, points out other benefits. Hundt, who oversaw the creation of a special $1 billion fund to wire schools for Internet access while commissioner of the FCC, says, "Technology is tremendous for multilingual situations because you can instantly translate anything. You can have 25 different languages in a class of 35 kids. Secondly, you can easily do testing, since much of the testing of children for learning disabilities can be done online. Third, with computers you can also effectively reduce the class size problem. One class of 30 students can become five classes of six students with computers in the center." A fourth benefit is "the ability to disseminate curricula to teachers over the Internet," he adds.

Nancy Mull, a high school teacher at Warshoe High School in Reno, Nev., can certainly attest to the last statement. "The Internet has given me a zillion terrific lesson plan ideas from all over the U.S.," she says. "It has helped me to become a much better teacher, and given the kids some fun, creative learning activities."

The Enthusiast Series from CyberMax is an AMD-K6-III-based, Windows 98-loaded line of machines that accelerate 2D and 3D titles with Voodoo technology from 3Dfx. In addition to providing high performance in home computing, the Enthusiast also offers a whole new dimension in gaming, with unprecedented visual effects and superior image quality.

PUTTING THE TOOLS TO WORK

Seeing how these "creative learning activities" work is one way to appreciate technology's benefit as an educational tool. Mull says she was able to "personalize" history when she recently taught a class about the Vietnam War. "Besides using the Internet for research, I posted a request in the veteran's section on America Online, asking for volunteers to be interviewed by my students via e-mail. Twenty vets responded, and my kids were so excited to get 'their own vet' to interview. They composed their own questionnaires, and checked the mail daily for a response from 'their vet.'"

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She says one vet from Florida agreed to be interviewed online, so the students "met" him in a private chat room to ask him questions. "Talk about fighting for the keyboard! And they kept going back to their textbooks to find more questions to ask him," she states.

Nancy Fisher, an instructional technology specialist at the Leesylvania Elementary School in Woodbridge, Va., says she also strives to integrate her computer lab curriculum with projects students are doing in other classes. "In the fourth grade our students study the state of Virginia. So in the computer lab I have the children break into teams of four or five and create their own travel agency, with the goal of planning a weekend trip to a specific city in Virginia. They research the city on the Internet, use Print Shop to write pamphlets, and produce a slide show using PowerPoint. We then have a Tech Fair for parents, who vote on the trip they would most like to take."

Nancy Willyard, a second-grade teacher at Norman A. Miller Elementary School in rural

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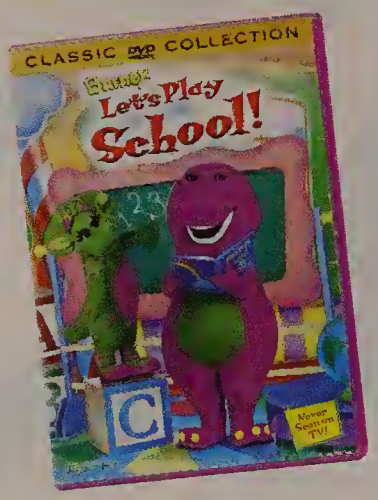
Computers Go Back to School

Barney's new "Let's Play School" DVD for preschoolers from Lyrick Studios features five learning products in one: a new full-length video, a sing-along with onscreen lyrics, an electronic book/read-along, songs from a new music album, and five interactive DVD-ROM games.



Cement City, Mich., says her students have had many "exciting experiences" with computers. "I can honestly say that by using the computer every day, my students have improved in their reading levels, stretched their minds, and increased their intellectual ability," she states. "It has also closed the gap between the top and bottom students."

TECHNOLOGY CHALLENGES

That's not to say technology doesn't present challenges. A significant one is what the NEA's Blake calls the "equity issue." "We need to address the disparity between who has computers at home and who doesn't," he states.

"This is a problem that concerns us all," Roden agrees. To deal with the discrepancy between the "haves" and "have nots," most schools make computers available to students in computer labs or school libraries before and after school hours.

One company attempting to address this issue is Seattle-based Microworkz Computer Corp.,

THE ABCs OF THE INTERNET

There's no question that the Internet is a tremendous educational resource for both students and teachers. "With the Internet you are opening the library of the world," says Jon-Paul Roden, department chair of the Vernon, Conn., public schools' computer department.

Yet finding useful information in this vast "library" is not always easy. Roden recommends that parents visit www.safekids.com and www.webteacher.org for helpful information about using the Internet. Beverly J. McCollum, an eighth-grade teacher at Wall Intermediate School in Wall Township, N.J., recommends www.hotsheet.com, and "Ask A Teacher" on America Online, where she is an assistant room leader. Other Web resources teachers' suggestions include www.familyeducation.com, www.yahooligans.com, and www.ajkids.com.

One advantage to these sites is they filter out sites that might be inappropriate for kids – a common concern for both parents and teachers. Roden says another safety concern is students giving out personal information over the Web. "I'm worried about who may be collecting this data."

Roden says one solution to these problems is to put the home computer in a public area. "Technology offers parents an incredible opportunity to be closer to their kids," he says. "If the computer is in the family room and parents are in the same room watching TV or reading, they will inevitably hear the child say 'Wow – look at this!' This gives the parent and child an opportunity to start a dialogue."

Don Blake, senior technologist at Washington, D.C.-based National Education Association, says, "Parental involvement is key. Look at how the kids are using the technology and make sure they understand the rules of the road – what sites they can/cannot visit and what kind of information they can give out."

CHECK YOUR SOURCES

Another issue is determining the credibility of information found on the Internet. "One of the most important things we need to teach high school students is not just how to find information on the Internet, but how to determine the accuracy of that information," says Beth Shepley, a biology instructor and department head at Avon High School in Avon, Mass. One way to address this is by looking at the source of the information on a Web site and determining who authored the site (for example, is it a commercial site? educational site? personal site?).

Roden says he often shows his students some "fake" sites to prove that not everything on the Web is factual. "I also take them to sites that are biased," he explains. "For instance, I might show them a site about the Civil War with a Northern perspective, and then show them another site which has a Southern perspective. I then ask the kids if each site showed both sides of the story."

Despite its flaws, most teachers still believe the Internet is an extremely valuable tool overall. "Without the Internet, some students in Cement City might never know what life was like outside this rural community," says second-grade teacher Nancy Willyard of Cement City, Mich. "It really has made a difference."

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Sony's Digital Mavica Camera is the nation's best-selling digital camera, and is the only one in the world that uses a standard 3.5" floppy disk. This makes it easy for users to move images from the camera to a PC, and lets users effortlessly add images to a home page.

which recently launched the WEBzter family of PCs as part of its "Everyone Deserves a Computer" initiative. Starting at $299, the WEBzter comes bundled with a year of unlimited Internet access and Corel's WordPerfect Suite software.

Another challenge that comes with technology is the issue of plagiarism. "Oh is it ever!" says Roden. "Plagiarism is a difficult concept to teach – no matter what the grade level." One problem, he explains, is that kids do not realize it is wrong to simply cut and paste things off the Internet. "That's why I'm now teaching middle school students about intellectual property," he states.

Yet despite these challenges, technology in the classroom is clearly expanding horizons for both students and teachers. As Beverly J. McCollum, a teacher at Wall Intermediate School in Wall Township, N.J., says, "Education is taking on a whole new facet. Teachers now have to be facilitators for learning and are not limited to imparting factual information. Students are not limited to learning what a teacher knows. They now take more ownership of their learning, which is limited only by the students themselves."

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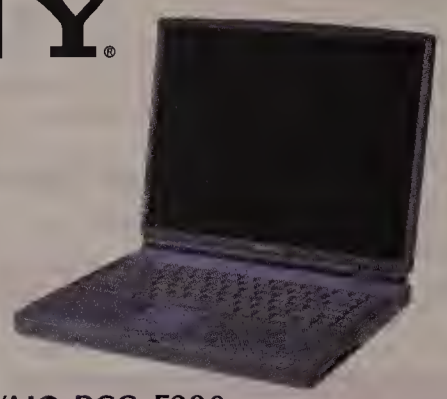

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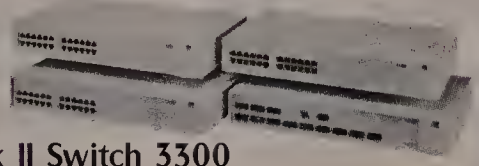

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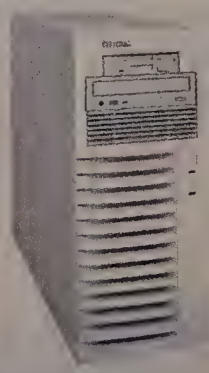

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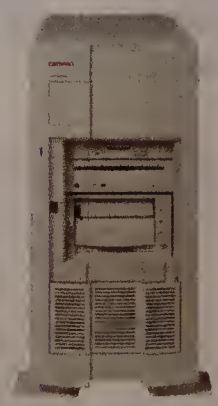

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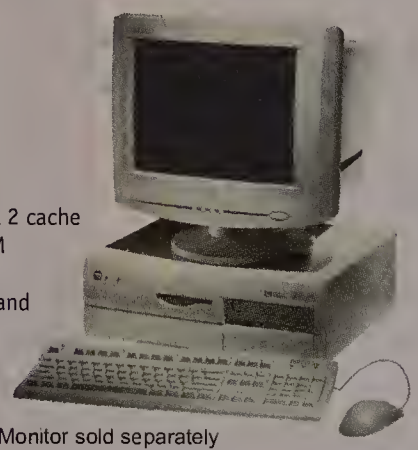

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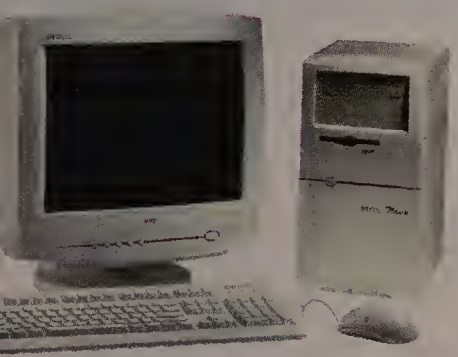
Monitor sold separately



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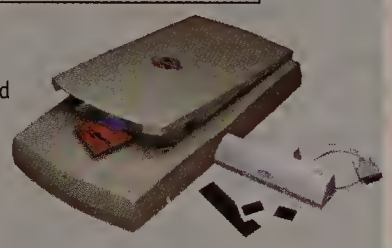

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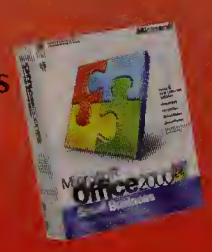

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NEW PRODUCTS

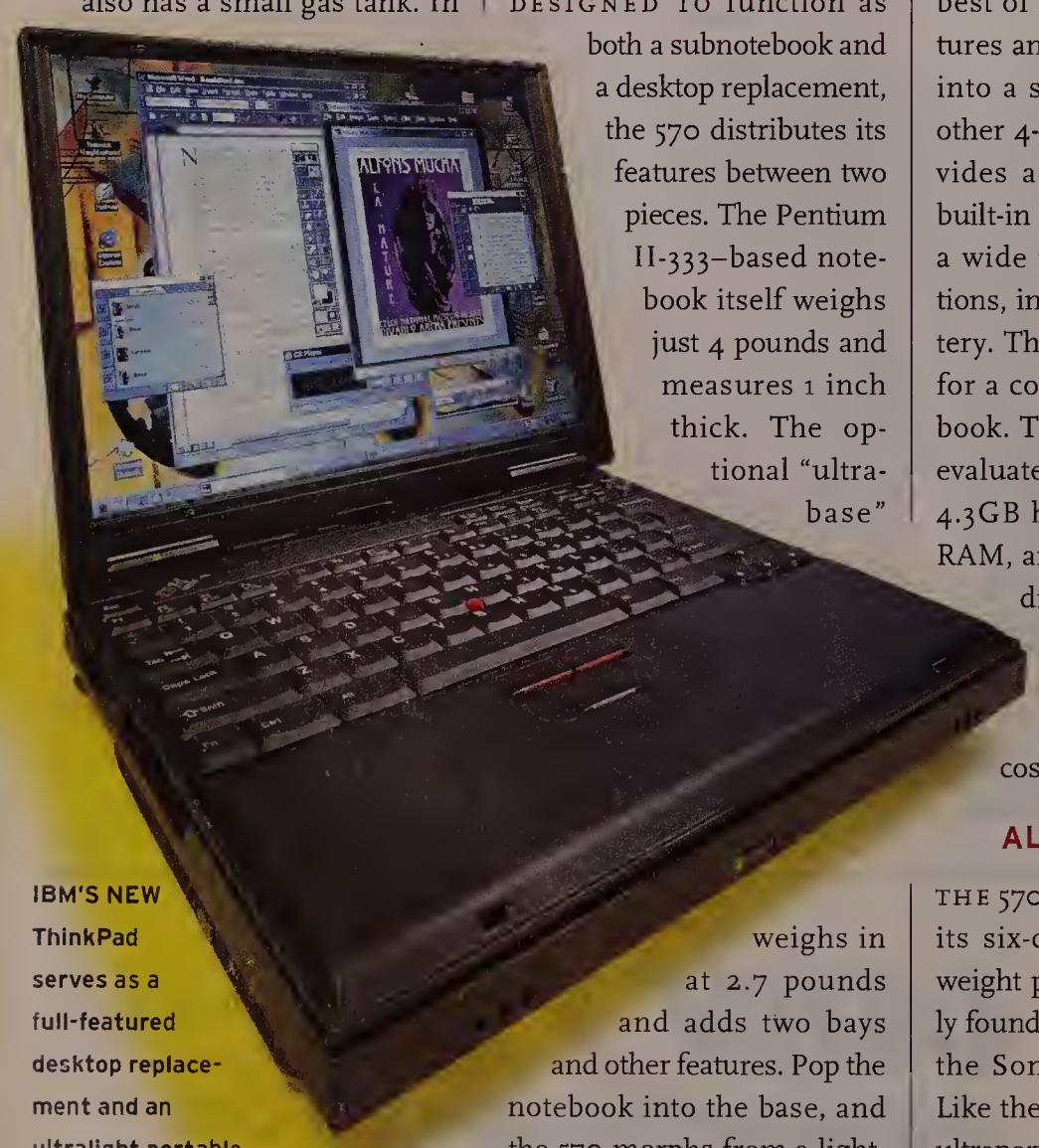
Two-Piece for the Road: IBM ThinkPad 570

NOTEBOOK

SUMMER'S HERE. Feel like putting your computer's top down? IBM's **ThinkPad 570** is Big Blue's first "convertible"—a two-piece notebook that lets you leave the nonessentials behind and travel with a light, ultrathin portable. Unfortunately, the successor to the wildly popular ThinkPad 560 also has a small gas tank. In our tests, the ThinkPad 570 lasted only 92 minutes on one charge—a shorter battery life than any similarly configured notebook we've tested. If you expect to work away from a power outlet most of the time, you might want to peel out with another machine.

QUICK-CHANGE ARTIST

DESIGNED TO function as both a subnotebook and a desktop replacement, the 570 distributes its features between two pieces. The Pentium II-333–based notebook itself weighs just 4 pounds and measures 1 inch thick. The optional "ultrabase" weighs in at 2.7 pounds and adds two bays and other features. Pop the notebook into the base, and the 570 morphs from a lightweight traveling companion into a 6.8-pound corporate laptop, complete with internal floppy (or second battery) and CD-ROM or other drives.



IBM'S NEW ThinkPad serves as a full-featured desktop replacement and an ultralight portable.

The ThinkPad 570 is not the first convertible notebook: Compaq introduced the "media slice" concept years ago. But the ThinkPad breaks new ground by cherry-picking the best of its competitors' features and compressing them into a smaller package. No other 4-pound notebook provides a 13.3-inch screen, a built-in 56-kbps modem, and a wide range of add-on options, including a second battery. The price is reasonable for a convertible-style notebook. The shipping unit we evaluated, configured with a 4.3GB hard drive, 64MB of RAM, and an external floppy drive, sells for $3099. The base, not including any of the add-on devices, will cost you another $119.

ALL LOCKED UP

THE 570'S MAJOR drawback is its six-cell battery, a lightweight power source normally found in ultraslims such as the Sony VAIO 505 series. Like the ThinkPad 570, such ultraportables typically run for only 90 minutes between charges, but they're a pound lighter than the undocked 570. Most midweight notebooks come with 8- or 12-cell batteries, which last much longer between charges.

Otherwise, the 570 is a well-designed machine. Like most notebooks its size, it includes standard connections and ports, but no internal bays. The bundled floppy drive attaches externally or through the base's right-hand bay. Alternatively, the right bay can accommodate a second battery ($209) that kicks in when the unit is docked and the first battery runs out of juice. The left bay will hold the 10X–24X CD-ROM drive, a 2X DVD-ROM drive ($335), an LS-120 drive ($225), a Zip drive ($269), or a second hard drive (a stiff $1065 for 10GB).

The 570's comfortable keyboard uses IBM's trademark eraserhead pointing device. This ThinkPad also offers

ThinkPad 570

PRO: Light and thin, good price, highly configurable.

CON: Short battery life, inconvenient base design, awful sound.

VALUE: Leader among convertible notebooks in features, but it's a poor choice if you need long battery life.

Street price: $3218 (including base)

IBM

www.ibm.com

800/426-7255

TEST PC WORLD CENTER THIS PRODUCT has been evaluated using tests designed by the PC World Test Center.

PHOTOGRAPH: MARC SIMON

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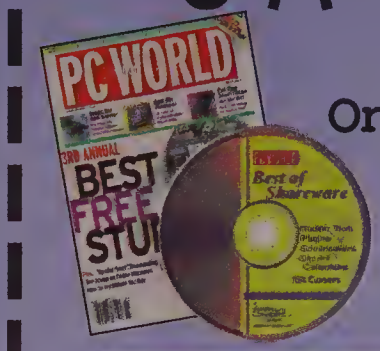

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decent speed: Its PC WorldBench 98 score of 178 is about average for its processor class.

A few minor beefs: Adding or removing a device requires detaching the base and navigating through layers of confusing locking levers and sliding tabs. And movie buffs eyeing the 570 as a DVD player will want to bring headphones. Even attached to the stereo speaker–equipped base, sound was weak and scratchy.

If you can stand the ThinkPad 570's skimpy battery life, you'll find that it offers an unbeatable combination of features from the portable and desktop worlds. Otherwise, give one of its competitors a spin. Toshiba's fuller-featured, more expensive Portégé 7000 and HP's competitively priced OmniBook 900 both last at least 2.5 hours on one charge.

—Carla Thornton

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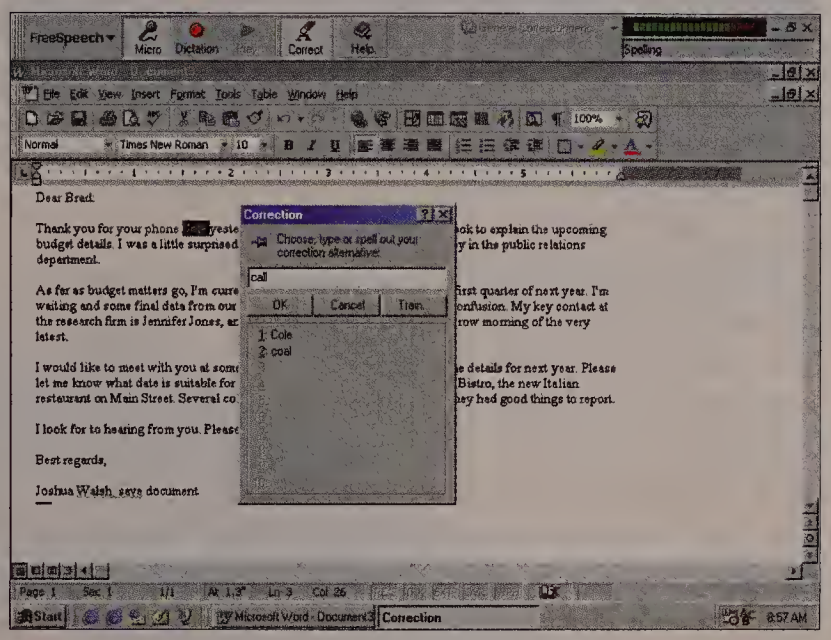
FreeSpeech 2000: Well Worth the Cost

SPEECH RECOGNITION

TALK CAN BE cheap: At $110, Philips **FreeSpeech 2000** is a really good deal. You get Pentium III–optimized dictation software that works in English and five foreign languages; multiuser options; voice playback; and a comfortable and sturdy Plantronics SR1 headset. Competing packages from Dragon and Lernout & Hauspie cost up to $50 more—without the foreign language capability. And FreeSpeech 2000 improves substantially on FreeSpeech 98, especially in accuracy and ease of use.

Unlike Dragon's Pentium III–optimized Point & Speak, which simply won't install unless it detects a Pentium III processor, FreeSpeech 2000 works—albeit sluggishly—with older CPUs. The minimum system requirements are a Pentium MMX-166 CPU and 48MB of RAM.

Training my preproduction version of the software took 20 minutes, and initial accuracy was so-so. FreeSpeech goofed on lots of common words—for instance, interpreting "thank you" as "punch you" and "international" as "ginger national." But accuracy improved as I corrected flubbed words on the fly.



FREESPEECH 2000 lets you correct misheard words by selecting a word from a list of suggestions or, if necessary, by typing it in.

I also schooled the software in my Irish-accented Italian, and was impressed by how well it handled dictation in that language.

The software's command-and-control features helped me open programs and cruise around the desktop with impressive speed, but navigating within an application proved to be tiresome. For example, when I said "save document" in command mode, the program usually treated my order as dictation.

For editing text, I appreciated the new EasyEdit mode, which plays back dictation and provides a simple dialog box for entering corrections. But editing by typing remains less frustrating by a wide margin.

FreeSpeech 2000 ably handles basic tasks such as e-mail, short correspondence, and desktop navigation—especially if you work in several languages. But hang on to your mouse and keyboard for relatively complicated operations like formatting text and doing heavy editing.

Also, unless you really can't stand being tethered to a headset or are prepared to submit to plenty of additional training, don't bother spending the extra $60 for the version that comes with Philips's SpeechMike. This plastic, electric shaver–size device with a built-in trackball and microphone replaces both a mouse and a conventional mike. But the SpeechMike's initial accuracy was much inferior to that achieved by the basic package's headset.

—Aoife McEvoy ▶

online FOR MORE PRODUCT news and the latest announcements, check out the PC World Daily News Service at www.pcworld.com/news.

FreeSpeech 2000

PRO: Friendly interface, helpful video tutorial, integrated foreign language recognition.

CON: Requires ongoing training, voice-based editing and formatting still cumbersome.

VALUE: Most useful for basic tasks and multilingual users.

Street price: $110 (with Plantronics SR1 headset); $170 (with Philips SpeechMike)

Philips Speech Processing
www.speech.philips.com
800/851-8885

PRODUCT INFO NO. 751

A Cold Shoulder for Sys's Overclocked System

DESKTOP PC

THE FASTEST Windows 98 system we've seen isn't a PIII-550—or any other Pentium. Sys Technology's **Cold Fusion** PC pushes its AMD K6-III-450 CPU well past its intended clock speed—an old trick called overclocking—to notch the best PC WorldBench 98 score ever for a Win 98 system. But few business users will want this oddball PC.

CHILL OUT: A base unit cools the overclocked CPU of Sys's Cold Fusion, which set a PC WorldBench 98 record for a PC running Windows 98.

In most cases, overclocking threatens a PC's health by creating more heat than a conventional heat sink can handle. The Cold Fusion eliminates this problem with a separate, 8-inch-tall cooling unit that acts (and sounds) like a small refrigerator. Sys guarantees the CPU—pushed to 550 MHz—for the same one-year period as it does for other preinstalled AMD processors.

Our shipping unit's PC WorldBench 98 score of 256 is about 6 percent faster than the 242 average for PIII-550s—an edge you won't notice in business apps. And the PC and cooling unit weigh about 66 pounds—more than twice as much as a typical midtower.

The $2899 street price matches the cost of a PIII-550 with similar high-end hardware (128MB of RAM, 13.6GB hard disk, 45X–52X CD-ROM drive, 3dfx Voodoo3 3000 AGP graphics card with 16MB of RAM). But you only get a 17-inch monitor; many top-flight systems now have 19-inchers. The hose that pipes air into the main case blocks access to the graphics card, which might annoy upgraders.

Bundled titles like Descent 3 and Unreal Tournament reflect the system's target audience: 3D gamers who want all the speed they can get—and bragging rights, no matter how fleeting. If that's not you, opt for a conventional PIII or K6-III system instead.

—Mick Lockey

Cold Fusion

PRO: Beefy configuration, runs faster than a PIII-550 system.

CON: High price, cooling unit adds considerable bulk.

VALUE: Modest performance gains aren't worth the extra heft.

Street price: $2899

Sys Technology

www.sys.com

800/613-9963

PRODUCT INFO NO.752

TEST PC WORLD CENTER THIS PRODUCT has been evaluated using tests designed by the PC World Test Center.

Here, There, and PCAnywhere 9

REMOTE ACCESS

LAST TIME I tried Symantec's PCAnywhere remote-access package, I spent hours trying to figure out whether I was the host, the guest, or someone impersonating a computing expert. New wizards and a snappy interface make **PCAnywhere 9** considerably easier to use than previous versions. However, in terms of the breadth of connections it supports, it still falls slightly short of archrival Traveling Software's LapLink Professional.

PCAnywhere 9 works with DOS and Windows 3.*x*, 9*x*, NT, and 2000—but not with Windows CE. In addition to standard phone lines and modems, PCAnywhere 9 supports TCP/IP and IPX/SPX networks, direct parallel cable, ISDN, and infrared connections. Unfortunately, direct Universal Serial Bus and Windows CE connections require additional software as well as cables. A new drag-and-drop file manager facilitates data transfers, which are protected by 128-bit encryption and Norton antivirus software.

For help-desk use (for example, obtaining immediate tech support) over the Internet, Yahoo's bundled Pager software creates a pop-up window to summon the remote user, who can then take charge of your PC by clicking a button.

Working with a preproduction copy, I easily connected to a friend's computer over the Internet, first using 28.8-kbps and 56-kbps modem connections, and later working with a cable modem. If you plan to run apps like Word and Excel at 28.8 kbps, set the display for monochrome rather than color to boost performance.

PCAnywhere 9 sells for about $169, a bit more than the $149 LapLink Pro; upgrades are a steep $100. For remote access with built-in virus protection, PCAnywhere 9 is a good choice. Windows CE and USB users are better off with LapLink Pro, which has software support for both.

—Steve Bass ▶

PCAnywhere 9

PRO: Easy installation, first-rate security and antivirus protection.

CON: Novices may find the interface confusing, no Windows CE or USB support, pricey upgrade.

VALUE: Solid remote-access package falls a little short in OS support.

Street price: $169, upgrade and competitive upgrades $100

Symantec

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Windows CE Palmtops Get Colorful

P D A s

HOW WOULD YOU like a personal organizer that doubles as a music and video player? Casio's latest Windows CE palm-size PC lets you view movies in color while listening to stereo soundtracks through earphones. I tried out a preproduction Casio **Cassiopeia E-100** and a shipping version of Philips's **Nino 500**, another new color Windows CE palmtop more squarely targeted at business users.

VIDEO COSTS EXTRA

CASIO BILLS its $499 Cassiopeia E-100 as the "world's smallest multimedia color palm-size PC," but it only fully earns this description if you spend $69 on an optional Multimedia Pack CD that adds mobile video and audio players. Otherwise, it's fairly large (5 1/8 by 3 5/8 by 3/4 inches) and bulky (9 ounces, about 3 ounces heavier than Palm IIIx devices), with a 240-by-320-resolution active-matrix touch screen.

The bright, handsome display supports 65,536 colors (most competitors max out at 256), so photos looked exceptionally rich, as did video clips in Casio's proprietary CMF video format. Since most of the Web and e-mail videos best suited to playing on such a device are in QuickTime, AVI, or MPEG-1 formats, you'd need to first convert them to CMF files using a desktop PC utility that comes with the player. Also, you'll have to put videos that last more than a few minutes on CompactFlash cards because the E-100's 16MB of RAM can't accommodate them.

NOT NOIR: The Cassiopeia E-100 plays videos in vivid color and stereo (with headphones).

You'll need your own earphones to experience the E-100's stereo capabilities, since the unit's speaker produces only mono sound. In my tests, an MP3 recording sounded first-rate. But again, you'll have to stock up on CompactFlash cards if you're planning to use the E-100 instead of a Diamond Rio MP3 player, which can hold 32MB, or about 35 minutes worth of CD-quality recordings. And while the Multimedia Pack lets you play files in Microsoft's new Windows Media Player audio format, you must download a Windows CE MP3 player on your own.

NUEVO NINO

PHILIPS'S $449 Nino 500 is the color successor to the Nino 300, one of the most successful Windows CE palmtops. It's a tad smaller than the Cassiopeia E-100 and weighs a bit less, too. The 256-color display looks terrific, and the software bundle is impressive. It includes BSquare's faxing, printing, and file-viewing programs; Applian Technologies' CoolCalc scientific/financial calculator; MobileSoft's Expense Manager; and the same AudiblePlayer that ships with the Cassiopeia E-100 (it's much better for voice recordings than for music). In addition to Windows CE's built-in keyboard and handwriting software (for data entry using a stylus on the touch screen), Philips gives you Tegic's T9 keyboard and ParaGraph's CalliGrapher handwriting recognition software. Finally, Philips's NinoVoice enables voice commands and voice control of the device.

STILL CLUNKY AFTER ALL THESE REVS

UNFORTUNATELY, neither of these units addresses our ongoing gripes about Windows CE, including some poor display planning. For example, I gave up trying to read the extension for a business phone number in my contact list, because it didn't fit on the screen and I couldn't figure out how to scroll the display. And while 3Com's monochrome Palm devices can run for weeks on a pair of AAA batteries, a color Windows CE palmtop will last only a few days, at the longest, between charges of its rechargeable battery pack (lithium ion for the E-100, NiMH for the Nino 500, which can also run on a two AA batteries).

If you've got your heart set on a color palmtop, think carefully about whether you really need it to play videos and music. The Cassiopeia E-100's gadget appeal may fade quickly when you start dealing with the hassles of file-format conversions, data transfers to CompactFlash cards, and short battery life. In the long run, Philips's Nino 500 is much more likely to hold up as a business tool.

—Yardena Arar ▶

Cassiopeia E-100

PRO: Plays videos with stereo sound (through headphones); great 65,536-color touch screen.

CON: You have to convert multimedia files on a PC first; battery life is short for multimedia use.

VALUE: Okay for hard-core gadget lovers; so-so for others.

Street price: $499

Casio

888/204-7765

www.casio.com

PRODUCT INFO NO. 700

Nino 500

PRO: Slick-looking color Windows CE palmtop, lots of bundled business applications.

CON: Color screen drains batteries faster than monochrome version.

VALUE: Good choice for business users who want a color Windows CE-based palmtop.

Street price: $449

Philips Electronics

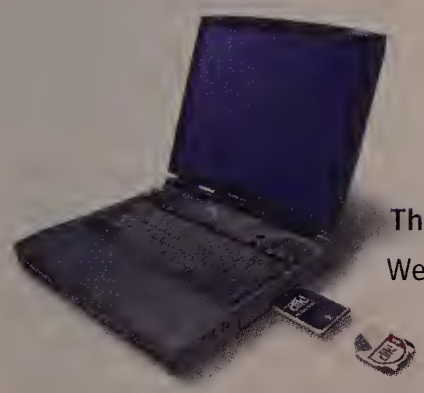
888/367-8356

nino.philips.com

PRODUCT INFO NO. 701

With a little drive, you can really go places.

ACTUAL SIZE



The amazing Clik!™ PC Card drive and 40MB disks. Tiny laptop storage that goes a long way. We've just changed the shape of portable laptop storage. The new Clik!™ drive actually disappears right into your laptop's PC Card slot then accepts the 2"x 2", 40MB disks. This is portable storage at its best. Convenient, cordless, easy to carry, easy to use, and affordable. Plus, the included QuikSync software creates effortless real-time backup of your laptop files, anytime, anywhere. At $199 for the drive (including 1 disk) and under $10 per additional disk,* this little drive is going to be the next big thing.

Grab your Clik! PC Card drive and disks wherever you buy computer products, or buy direct at: www.iomegadirect.com

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*Under $10 when purchased in a 10-pack. Prices listed are estimated retail prices. Actual prices may vary.

Killer 3D Cards From Diamond and Matrox

GRAPHICS CARDS

3D DELIGHT: Matrox's Millennium G400 Max delivers great performance and features.

MANY OF today's graphics cards handle standard office applications more than adequately, but if you play the latest 3D games and want the fastest, most eye-popping, and most realistic images to date, you might want to consider upgrading to a new graphics board. Two of the newest—Matrox's **Millennium G400 Max** and Diamond Multimedia's **Viper V770 Ultra**—blow away nearly all accelerators we've tested to date, including those on this month's *Top 10 Graphics Boards* (page 245). We tested shipping versions of each.

Both cards include utilities for changing display settings. The Matrox's tools are suitable for business users, while the Diamond's are geared toward gamers, with real-time previews of the settings you wish to adjust. Although these boards will be compatible with the 4X AGP bus expected to appear in computers later this year, we tested them using the current 2X AGP interface. In addition to our standard graphics board test suite (see "How We Test," www.pcworld.com/aug99/np_graphics_boards), we ran tests using Rage Software's Expendable and Quake II in 16-bit color and 1024 by 768 resolution.

MATROX TO THE MAX

FOLLOWING IN the footsteps of the G200, the Millennium G400 Max adapter (its processor shares the name) excels at both business graphics and 3D gaming. Its $249 price isn't excessive, considering that it includes the game Expendable and Micrografx's Picture Publisher photo editor, and has DualHead capability. This feature enables you to connect your Windows 98–equipped PC to two monitors (or a monitor and a TV) using a single G400 board. It also lets you view and zoom in on different applications. And if you have a DVD-ROM drive, you can play a DVD movie on a TV while you work on your desktop.

For those who use digital LCDs, Matrox offers a $59 daughterboard that connects to a monitor based on the new DVI standard supported by most major vendors.

VIPER V770 ULTRA: FAST BUT FLAWED

USING NVIDIA'S new RIVA TNT2 chip, the $250 Viper V770 Ultra delivered higher frame rates than the Matrox in Redline Racer and Flight Unlimited II, and performed as fast as the Matrox in other 3D tests. But colors in some game scenes appeared washed out, and the Viper's AVI video playback was significantly choppier than the Matrox's.

Diamond's generous software bundle includes a couple of games and a PowerPoint plug-in from Crystal Graphics. But overall, the Viper is too pricey for what you get. If you can afford to shell out $250, choose the fuller-featured Matrox Millennium G400 Max.

—Grace Aquino ▶

Millennium G400 Max

PRO: Great performance for both business graphics and 3D games.

CON: None significant.

VALUE: An all-around top performer with lots of extras, such as dual monitor support and bundled image-editing software.

Street price: $249

Matrox Graphics

800/361-1408

www.matrox.com/mga

PRODUCT INFO NO. 702

Viper V770 Ultra

PRO: Fast; good software bundle.

CON: Choppy AVI video playback.

VALUE: Great for gamers, but too expensive given lack of TV features.

Street price: $250

Diamond Multimedia

800/468-5846

www.diamondmm.com

PRODUCT INFO NO. 703

TEST PC WORLD CENTER THESE PRODUCTS have been evaluated using tests designed by the PC World Test Center.

QUICK TAKES

Lotus's Toolbar PIM/Browser

LOTS OF WEB sites offer free personal information management services these days. Lotus, in a twist, is giving away a mini-desktop PIM that also links to your favorite Web sites. SmartCenter is a skinny toolbar that fits neatly at the top or bottom of your desktop, with menu buttons for constantly updated Web content as well as major PIM components (calendar, contacts, and reminders). Unfortunately, SmartCenter imports data easily only from stand-alone versions of Organizer; otherwise, you're better off making all entries manually. Overall, SmartCenter is handy, unobtrusive, and free—at least until November 1. Lotus Development; 800/343-5414; www.lotus.com.

PRODUCT INFO NO. 709

—Susan Perschke

3M's Perkier Post-it Notes

THREE CHEERS for 3M's Post-it Software Notes 2 ($25, upgrade $15), which puts a small pad on your Windows 95 or 98 desktop, taskbar, or both. Click the pad to dispense notes that stick to your desktop until you trash them. A tiny slide-out toolbar enables you to add alarms, perform text searches, and create bulletin board–like "memo boards" for storing notes. (Networked users can share memo boards.) My preproduction copy let me write much longer notes (32,000 characters versus the original's 1000), and peruse trashed notes. You can also change your note color, add headings such as "To Do" or "From the Desk Of," insert pictures, and use fancy fonts. 3M; www.3M.com/psnotes.

PRODUCT INFO NO. 708

—Yardena Arar

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Is It Real or Is It Deep Paint?

GRAPHICS

A WHOLE ART store worth of goodies awaits you inside Right Hemisphere's **Deep Paint**. This paint package lets you work with digital versions of watercolors, oils, charcoal, pastels, and more. Wielding these virtual media using a pressure-sensitive pen tablet and a shipping copy of the program was uncannily like working with their real counterparts—but a whole lot neater. You can also apply a bevy of textures, ranging from authentically crackled stucco to frog skin and cartoon fur.

Aimed at serious artists, this $249 package operates both as an Adobe Photoshop plug-in and as a stand-alone program. Its many art tools are highly customizable. Also, support for layers and cloning let you turn photos into faux paintings or sketches with ease.

However, Deep Paint is far less of a full-blown image editor than its closest competitor, MetaCreations' $299 Painter 5.5 Web Edition. For instance, Deep Paint's options for adding text, managing colors, and resizing graphics are rudimentary, and it can't create Web-specific features such as rollover buttons. As a result, it's more useful as an addition to Photoshop's already potent toolbox than as a stand-alone package. But while Deep Paint could use more workaday capabilities, its natural-media features are already highly functional—and a blast to use.

—Harry McCracken

Deep Paint

PRO: Terrific natural-media art tools and textures, good customization options.

CON: Doesn't provide a comprehensive set of image-editing features.

VALUE: Top-notch as a Photoshop plug-in, and great fun as a stand-alone application, but it's not a well-rounded image editor.

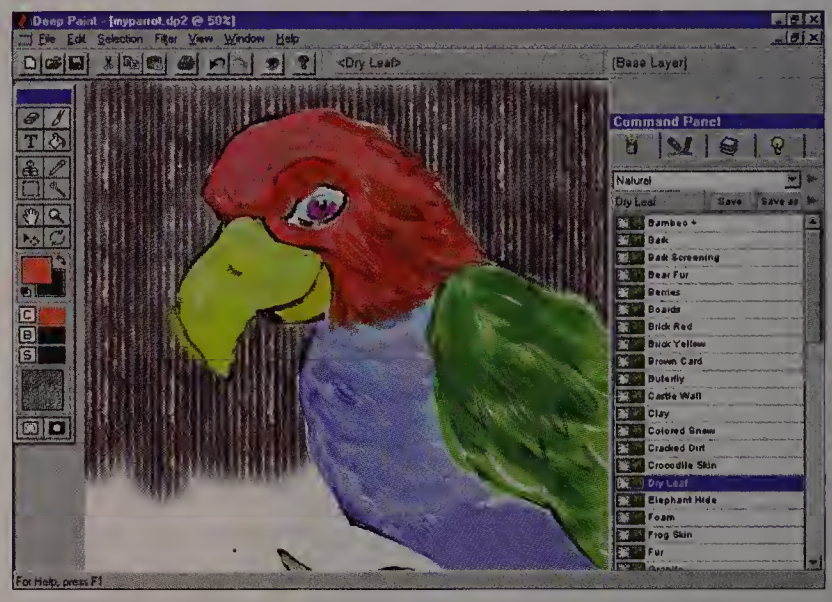
List price: $249

Right Hemisphere

877/309-3204

www.righthemisphere.com

PRODUCT INFO NO. 704



KEEPIN' IT REAL: Deep Paint produces pictures that look as though they were created with natural media such as charcoals or pastels.

Orb Portable: Big Storage, but Too Slow

STORAGE

IN THE ever-growing universe of removable-media drives—useful devices for backing up or transferring data—Castlewood Systems' Orb 2.2GB is one of the most innovative newcomers. The EIDE version, a Best Buy in our recent "Floppy Killers?" review (www.pcworld.com/jun99/removable), delivers eyebrow-raising performance and uses the cheapest per-megabyte media. Unfortunately, the new external version of the drive falls short of the standards set by its internal siblings.

The price is still right: Like the internal EIDE and SCSI Orbs, the parallel port–based **Orb 2.2GB Portable Drive** sells for $200, compared with $350 for Iomega's external 2GB Jaz drive. And the 2.2GB Orb cartridges retail for $30, or about 1.3 cents per megabyte, versus about $125 for a 2GB Jaz cartridge. The Orb's parallel port cable hooks up easily. However, the leisurely speed of the connection, typical of parallel port drives, is decidedly mismatched with the drive's huge capacity. Everything you do seems to take forever.

The shipping unit I evaluated took over 4 hours to make a compressed image backup of the 1.4GB of data on my PC's hard drive. A SCSI or IDE drive such as the Jaz, or even a slow tape drive, does the job in less than an hour.

The software bundle—the most extensive shipped with any removable-media drive—includes a media-copying utility, a catalog app, and backup programs such as an image file for emergency data restoration. The Orb is also the only parallel port drive I've seen that comes with a utility for fine-tuning your PC's printer port in case you have problems printing with the pass-through connector. The drive's 32-page manual covers all contingencies in detail.

Orb 2.2GB Portable Drive

PRO: Inexpensive media, comes with extensive utilities.

CON: Painfully slow.

VALUE: Worthwhile only for a group of several people who must share a drive that accepts high-capacity media. Others should opt for the internal SCSI or EIDE version.

Street price: $200, disks $30 each

Castlewood Systems

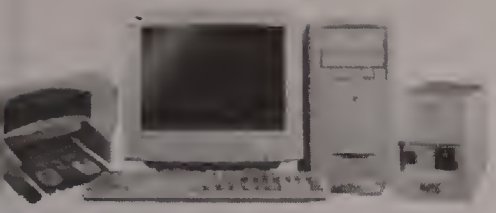
925/461-5500

www.castlewood.com

PRODUCT INFO NO. 705

This Orb will do if several PCs must share one removable storage device and users need the roomy cartridges. External Jaz drives, though faster, are not only more expensive but also use a SCSI interface, which fewer systems are likely to have. But a drive this big and slow is impractical for most users. Despite the installation hassles associated with internal drives, go with the SCSI or IDE version of the Orb drive instead.

—Stan Miastkowski ▶



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A-LIST PCComputing

Why 8 million PC users can't be wrong about APC power protection.

Power problems are the largest cause of data loss and occur 15 times more frequently than computer viruses. Besides an outright power outage, keyboard lock-ups, system crashes, corrupted data and lost Internet connections are also symptoms of power irregularities. These events cause interruptions and interfere with your ability to get the job done.

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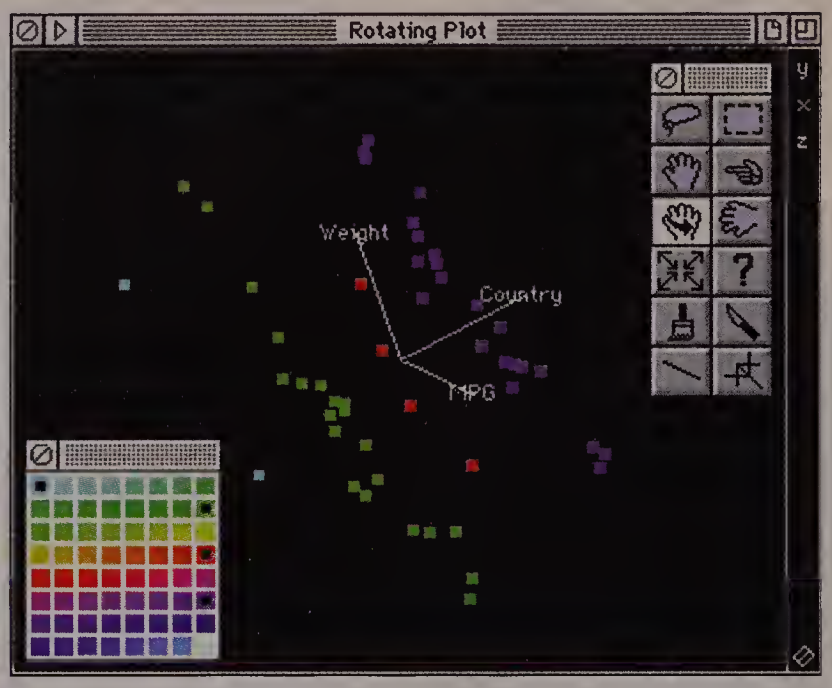
Graphical Analysis for Excel

DATA ANALYSIS

SPREADSHEET tables give you the building blocks for statistical analysis, but a picture can be worth a thousand cells. Data Description's **Viz-on**, a $150 Excel add-in, produces views of data that show connections between inputs and results. It delivers about 80 percent of the features in Data Desk, Data Description's $650 exploratory data analysis package. (EDA is a statistics term for interactive data graphics.)



GETTING THE SPIN RIGHT: Viz-on's rotating 3D graphics can help business users visually identify relationships in their data.

Viz-on provides Excel menu options for analyzing up to three variables. Choose a spreadsheet range and an option to produce a rotating 3D plot, plus friendly, almost chatty, explanations. My shipping unit worked with Excel versions as old as 4.0.

Viz-on's 3D graphics export nicely to PowerPoint, but they aren't ideally suited for standard presentations. The fine tutorial could provide more examples for beginners, but overall, Viz-on is a first-rate tool for analyzing Excel data.

—Charles Seiter

Viz-on

PRO: Generates information-rich graphics from Excel spreadsheets.

CON: Takes time to master.

VALUE: Convenient for business-people who have little background in statistics.

List price: $150

Data Description

800/573-5121

www.datadesk.com

PRODUCT INFO NO. 740

PhotoChute3 Eliminates Data Transfer Hassles

DATA TRANSFER

IF YOU USE a notebook, a digital camera, a Windows CE portable, or even an MP3 player, you've probably wrestled with data transfers between PC Cards, CompactFlash or SmartMedia cards, and your desktop PC. But until now, even the best card readers have been a pain to install, and have hogged PC ports.

Antec's $119 **PhotoChute3 USB** drive is easy to install and to use. When I plugged a shipping unit—about the size of two stacked audiocassettes—into a Windows 98–based PC's Universal Serial Bus port, the software loaded automatically and the device worked without requiring a reboot.

Each of PhotoChute3's two slots—one for Type I or II PC Cards, the other for wafer-thin SmartMedia cards—gets its own drive letter. You drag and drop or copy files as you would with any other PC drive. (For CompactFlash cards, you use a supplied PC Card adapter.)

As with other USB devices, you can remove or attach PhotoChute3 on the fly. It's easy to add USB ports to accommodate new devices, so you don't have to worry about port-sharing conflicts. In contrast, ActionTec's parallel port–based CameraConnect won't work with all printers using the same parallel port.

On occasion, the PhotoChute3 drive did not respond to read/write requests, a glitch that Antec attributes to kinks in USB drivers in both PhotoChute3 and Windows 98. But unplugging and reattaching the drive always solved the problem. On the whole, PhotoChute3 USB is the best device to date for transporting data between a desktop PC and compact storage media.

—Michael S. Lasky ▶

PhotoChute3 USB

PRO: Exceptionally easy to install, reads all popular removable flash-memory media.

CON: Doesn't always respond immediately to read/write requests.

VALUE: A very convenient product for those who do a lot of work with flash memory.

Street price: $119

Antec

510/770-1200

www.antec-inc.com

PRODUCT INFO NO. 706

QUICK TAKES

Diminutive DVD-ROM Drive

WITH ITS LIGHT, ultrathin case and its ability to draw power from the notebook it attaches to, Addonics' **PocketDVD** is the portable DVD-ROM drive for the rest of us. Weighing just 15 ounces, the nearly 1-inch-thick drive connects to any 200-MHz (or faster) notebook PC via the PC Card Type I or II slot. PocketDVD comes with Windows 9*x* MPEG-2 decoding software, so DVD movies run in smooth video streams. I installed a shipping unit on a Dell Inspiron 3200 notebook with Windows 98 in about a minute. This $399 drive comes with an AC adapter; using it doesn't affect performance but is easier on the battery. PocketDVD is great for notebooks whose CD-ROM drives can't be upgraded to DVD. However, it might be too bulky to use conveniently on an airplane. Addonics Technologies; 888/584-8324; www.addonics.com.

PRODUCT INFO NO. 773

—Michael S. Lasky

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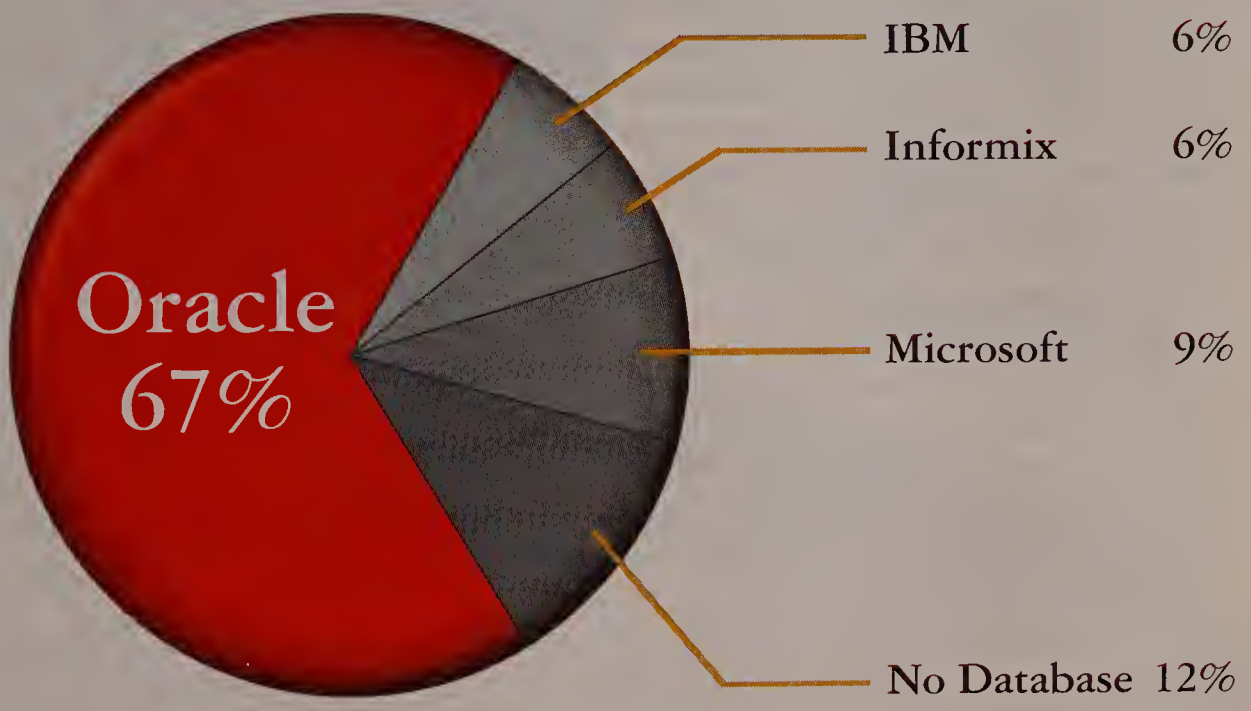
The Top 50 E-commerce Web Sites



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Visual Pick-Me-Up for PowerPoint, Excel

GRAPHICS ADD-ON

BORED BY your passé PowerPoint slides and Excel charts? With MetaCreations' **Office Advantage,** even casual presenters can add pizzazz to their graphics in minutes. Fine-tuning the results, however, requires more study.

The $99 program consists of two add-ons—PowerPoint Advantage and Excel Advantage—that place a toolbar on each of those Office applications. To enhance an open PowerPoint slide show, I simply clicked the Enhance Presentation button; in about 30 seconds my shipping unit smoothed jagged type, cleaned up graphics, and added new slide transitions. Not everything changed, but the whole show looked more professional. I was able to change slide order, transitions, and background and font colors. I also added audio annotations, printed the file, and saved it in PowerPoint and HTML formats—all without losing my Advantage enhancements.

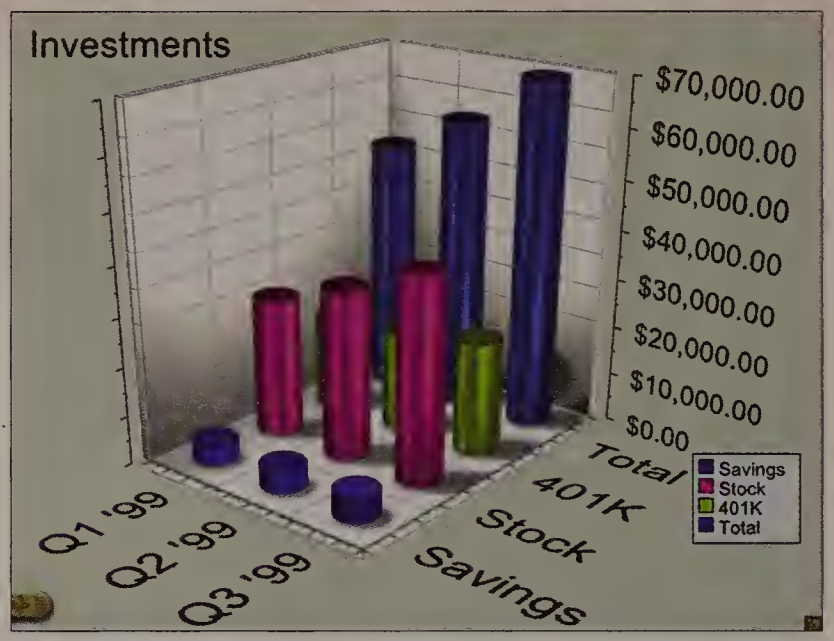
With Excel Advantage, I selected a range of spreadsheet data, clicked once, and got a striking multicolored 3D bar chart that Excel alone could not produce. Some elements occasionally got lost—a chart title, for example—but MetaCreations said this would be fixed in a downloadable patch.

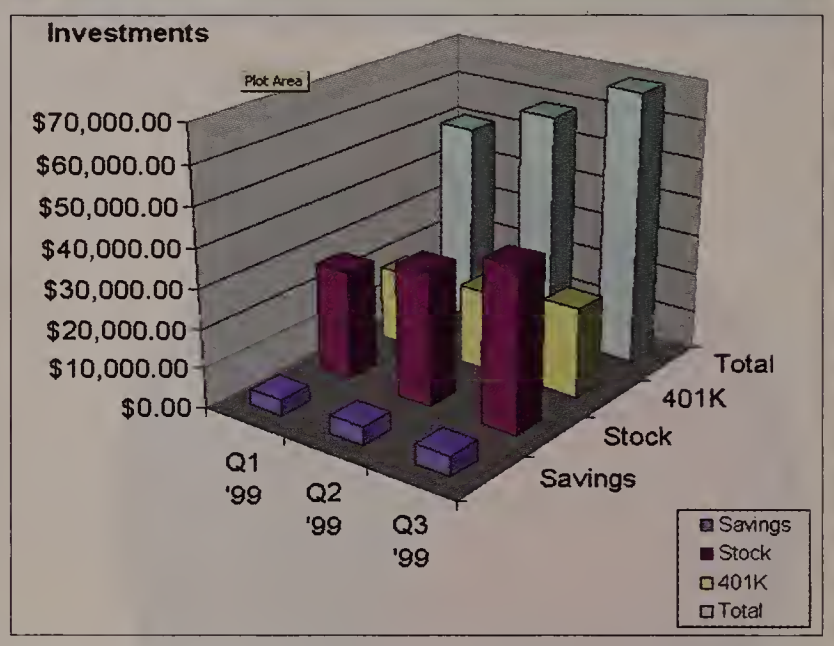
You can customize the one-click enhancements using the full add-on interfaces (PowerPoint's launches automatically, Excel's appears at the click of a toolbar option). Both interfaces duplicate some PowerPoint or Excel functions, and the font used for some menu items is too faint.

MetaCreations' lucid, well-illustrated manual, tutorials, and sample presentations help clarify the more advanced options, but I suspect that most users—myself included—will choose to stick with the auto enhancements.

To see enhanced documents on a PC without Office Advantage, you must save them in HTML format and use a free browser plug-in. Still, many users—especially novices—will find Office Advantage a handy, reasonably priced tool for quick visual fixes to presentations and charts.

—Shane Rau ▶





PRESTO CHANGE-O: With a single click, Office Advantage turned our lackluster Excel chart (bottom) into a flashy 3D graphic.

Office Advantage

PRO: One click beautifies PowerPoint presentations or Excel charts.

CON: Customizing options can be complicated.

VALUE: Best for novices seeking quick fixes to humdrum Office docs.

Street price: $99

MetaCreations

800/846-0111

www.metacreations.com

PRODUCT INFO NO. 707

QUICK TAKES

Sign Here, Please

HAVE YOU EVER tried using your mouse to sign an electronic letter or other document? Interlink Electronics' $70 EPad is a much more effective alternative. Unlike other 3.5-inch-wide touchpad-and-stylus devices geared toward graphics applications, the EPad comes bundled with software—PenOp Personal and WinTab—that enables you to affix your John Hancock to documents that were created in Microsoft Word. (For signatures that are good enough to hold up in a court of law, PenOp sells a $99 upgrade.) The unit is available in a serial port model only. Interlink Electronics; 800/340-1331; www.interlinkelec.com.

PRODUCT INFO NO. 710

—Andrew Brandt

Recording Star

WITH CD-RECORDABLE and CD-Rewritable media going for less than $1 and about $10 respectively, these 650MB discs are more affordable than ever for making personal copies of your favorite audio CDs. The hot-swapping, plug-in convenience of Sony's fast $399 Spressa USB CRX100E/X CD-R/RW drive makes the job easy. My shipping unit installed in 5 minutes—no PC reboot required. To save desk space, the 4-pound device can sit vertically. Sony bundles Asimware's HotBurn CD creation software (which does the job, but isn't as easy to use as Adaptec's Easy CD Creator) and Stomp's CD Stomper for producing CD and jewel-case labels. Spressa requires Windows 98, a 233-MHz or faster CPU, and 16MB of RAM. Sony Electronics; 800/352-7669; www.sony.com/storagebysony.

PRODUCT INFO NO. 711

—Michael S. Lasky

DVD for Under $2000

Now you can enjoy a DVD-ROM drive, 400 MHz with 128K of integrated full speed L2 cache, 32 MB of SDRAM a 6 GB Ultra DMA hard drive and a 3.5" floppy disk drive for under $2000! Our feature rich WinBook XL² also is equipped with cutting-edge features and slim, lightweight design. Industry-leading 2X AGP graphics using ATI's RagePro LT chipset drive a brilliant 14.1" XGA TFT display. Order yours today!

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- *45 Watt/hour Lithium Ion Smart Battery*
- *128K Integrated L2 cache On chip*
- ***3.5" floppy disks drive and 2x DVD-ROM drive (reads CD-ROM, CD-R and CD-RW) both built-in, no need to swap***
- *Integrated Dual-Button Touchpad*
- ***3-D PCI Audio***
- ***2x AGP Graphics Port***
- *Two Type II PCMCIA slots, CardBus and Zoomed Video supported*
- *Parallel, Serial, PS/2, VGA, 2-way Infrared port, S-Video and TV out, USB*
- *Kensington lock support*
- *One-year Limited Extendable Warranty*
- *Microsoft Windows® 98, pre-installed*

$1999

400 MHz, 32 MB/6 GB

No money down business lease
$67 per month – 36 months‡

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Circle 254 on card or go to www.pcworld.com/productinfo

Pump Up Your Palm With These Power Products

ACCESSORIES

GOT PALM? If so, you've also got plenty of company. With nearly 4 million units sold, 3Com's 3.5-year-old line of personal digital assistants has become ubiquitous in business circles around the world. All Palm PDAs—from the original PalmPilots to more recent Palm IIIx and V models and the spanking-new wireless Palm VII (see *Top of the News*, page 74)—come with software that lets you track appointments, contacts, to-dos, expenses, and e-mail. But not surprisingly, a host of third-party vendors are targeting this enormous market with products that are designed to make Palms even more useful. More than 2000 software titles and 400 hardware devices enable Palms to take on everything from paging, printing, and GPS mapping to Web access, editing spreadsheets, and using enterprise applications. Here are some of the best.

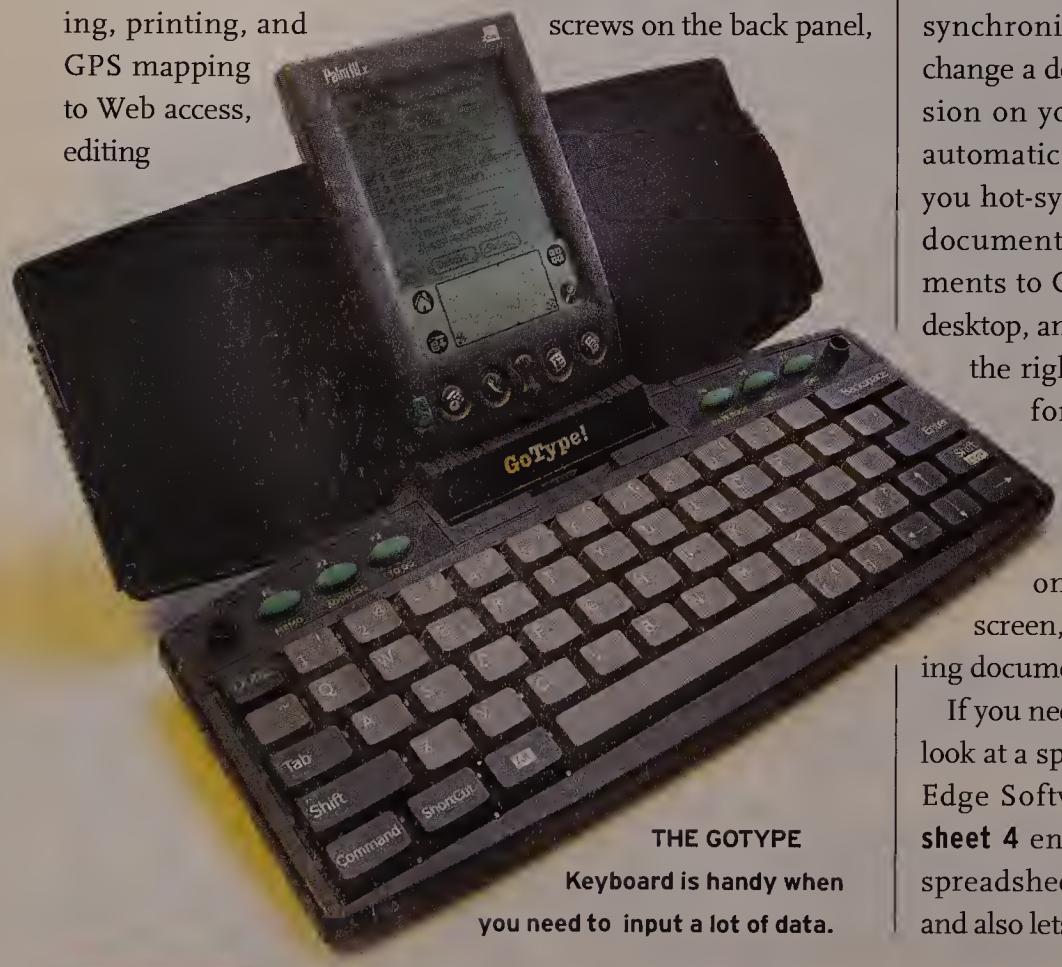
THROW YOUR PAGER AWAY

WHY CARRY two devices when one will do? PageMart Wireless's $129 **Synapse Pager Card** for the Palm III lets you receive text messages of up to 300 characters and update your calendar. So you don't waste time reading unimportant messages, a Sender ID feature tells you who's trying to reach you—assuming that person is in your Palm contacts database. And the Palm Calendar can be updated wirelessly without the usual desktop synchronization ritual.

The Pager Card comes with 2MB of memory and replaces the Palm III's 2MB memory card: Just remove the small screws on the back panel, exchange the cards, attach the supplied back panel, and you're done. The Synapse notifies you of incoming calls with a message and an audible alert—even when your Palm is turned off. Basic service costs $20 per month for national roaming with voice mail, news, regional weather, and sports bulletins; you can pay extra to get stock quotes. PageMart also sells a pager card for pre–Palm III Palms.

• **PageMart Wireless;** 800/318-2010; www.pagemart.com

PRODUCT INFO NO. 759



THE GOTYPE Keyboard is handy when you need to input a lot of data.

LEAVE YOUR NOTEBOOK BEHIND

IF YOU NEED to read word processing or spreadsheet documents while traveling, the Palm until recently has been no substitute for a Windows notebook. DataViz's $40 **Documents to Go** doesn't let you edit, but it does let you view word processing and spreadsheet files from Claris, Corel, Lotus, and Microsoft. It also synchronizes them: If you change a desktop file, the version on your Palm updates automatically the next time you hot-sync. Simply drag a document into the Documents to Go window on the desktop, and the files become the right size and format for Palm viewing. Large or complicated spreadsheets are hard to view on the small Palm screen, but word processing documents fare better.

If you need to do more than look at a spreadsheet, Cutting Edge Software's $50 **Quicksheet 4** enables you to edit spreadsheets on your Palm, and also lets you transfer them to or from Microsoft Excel.

Quicksheet supports 45 financial, statistical, date and time, and aggregate functions, and handles 15 named sheets per workbook. It doesn't support all Excel formatting but it does transfer all cells and values. Admittedly, dealing with spreadsheets on a small Palm screen is problematic, but Quicksheet's zippy zooming capabilities ease navigating. Quicken users who are fanatical about tracking their expenditures will appreciate LandWare's $40 **Pocket Quicken**. Instead of having to take notes each time you spend a few dollars and then retype the information when you're back at the desktop, you can simply enter the information into Pocket Quicken. The next time you hot-sync your Palm, the data will automatically transfer to Quicken. ▶

SPOTLIGHT

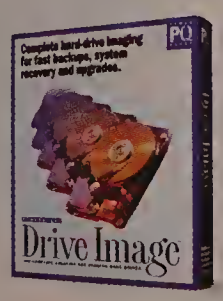
3COM'S Palm Computing calls its Palm devices "connected organizers." Third-party applications and accessories make these PDAs even more connected. We look at eight products that let you:

- Use the Palm as a pager
- Read spreadsheets and text documents
- Access Web content
- Use GPS satellites for street-level navigation
- Print documents

PHOTOGRAPH: MARC SIMON

IF YOU'RE NOT FULLY PROTECTED YOU COULD LOSE MORE THAN JUST FACE.

Get PowerQuest® Protected and put your hard-drive problems on ice.



DRIVE IMAGE®
Drive Image creates a compressed backup file of your hard drive. This image file will help you recover from hard drive crashes and makes upgrades easy.

LOST & FOUND™
Lost & Found allows you to quickly restore deleted data or reclaim files using the same solution as data recovery centers. As long as your disk still spins, Lost & Found can locate and recover your files.

PARTITIONMAGIC®
PartitionMagic makes it easy to create, resize, move and convert partitions on the fly without destroying your data. Now you can reclaim wasted hard-disk space, safely run multiple OSes, and organize and protect your data.

With more features than you can shake a stick at, it's not hard to see why PowerQuest is the recognized leader in hard-drive management. With a full range of powerful software solutions, PowerQuest has all the tools you need to keep your data safe from corrupted media, viruses, hard-drive crashes and the year 2000. For a free demo of Drive Image, Lost & Found and PartitionMagic, visit us at www.powerquest.com/ad or call us at 1-888-801-1945 for more information and get the cold, hard truth about organizing and protecting your data.

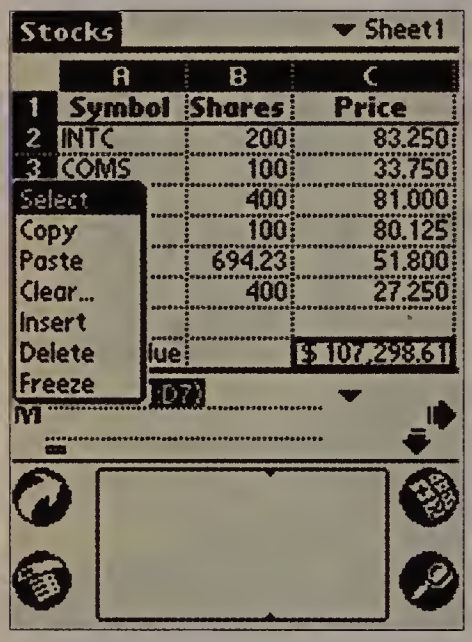
For more information and a free demo, visit our website.

www.POWERQUEST.com/ad

1999 PowerQuest Corporation. All rights reserved. U.S. Patents 5,675,769 and 5,706,472. Other patents pending in the U.S.A. and elsewhere. PowerQuest, Drive Image, and PartitionMagic are registered trademarks* and DataNow and Lost & Found are trademarks of PowerQuest Corporation in the U.S.A. and elsewhere.

Pocket Quicken works only in one direction—you can't send Quicken data (other than current balances) from your PC to your Palm. And it works only with Quicken 99 or the upcoming Quicken 2000. The program can track up to 15 checking and savings accounts, but it doesn't work with investment accounts. Pocket Quicken does support the desktop app's timesaving QuickFill type-ahead feature.

Browsers for Palm devices have been available for some time, but they are expensive, work only with a limited number of sites, and are horrendously slow. AvantGo's free **AvantGo.com** service is a welcome alternative. Though not a full-fledged browser, it lets Palm users access Palm-optimized content from hundreds of sites during routine hot syncs. After installing AvantGo's software on both your desktop and your Palm, you subscribe to the sites that interest you, choosing from a long list. Sites update automatically on your desktop when you're online, and fresh content downloads to your device each time you hot-sync. Transfers are fairly speedy thanks to AvantGo's file-compression technology. On the Palm itself, AvantGo displays headlines that you can tap to view full text. And if your device is still in the cradle syncing or connected to your desktop via modem, any interactive online activity, such as tapping on a hyperlink, is handled on the fly.



CREATE SPREADSHEETS on the Palm with Quicksheet 4.

Content providers range from Bloomberg for market and money news to MapBlast for interactive street-level maps and door-to-door driving instructions. The New York Times, Wall Street Journal, and Variety sites (among others) deliver headline summaries or full text, whichever you prefer. Talk about having the Web in your pocket!

In addition to connecting to the earthbound Internet, the Palm can communicate with the sky-high Global Positioning System network to pinpoint locations anywhere in the world. DeLorme's $159 **Earthmate GPS Receiver**, an updated, slimmer version of its previous Tripmate, goes better with the Palm's lean silhouette. Earthmate connects to the Palm via a $20 optional attachment for its serial-port plug. Using data beamed down from GPS satellites, the Palm displays your current longitude and latitude, elevation, and other information. And by loading regional maps from the bundled Street Atlas USA 6.0 desktop software, you can situate yourself at a precise location on street-level maps. If you load driving instructions as well, the Palm even warns you with a beep as the next turn approaches. Earthmate operates on its own AAA batteries, so it doesn't drain the Palm's.

- **DataViz;** 800/733-0030; www.dataviz.com

PRODUCT INFO NO. 760

- **Cutting Edge Software;** 800/991-7360; www.cesinc.com

PRODUCT INFO NO. 761

- **LandWare;** 800/526-3977; www.landware.com

PRODUCT INFO NO. 762

- **AvantGo;** 650/638-3399; www.avantgo.com
- **DeLorme;** 800/452-5931; www.delorme.com

PRODUCT INFO NO. 763

PINPOINT street addresses with the Earthmate GPS Receiver.

GET IT WRITE

IF YOU PREFER an actual keyboard to the Palm's Graffiti handwriting recognition scheme, then check out LandWare's $80 **GoType Keyboard**, for all Palms except the Palm V. Requiring no batteries (it draws the little power it needs from your Palm), the keyboard comes with a clamshell lid that acts as a docking stand: Simply plug in the Palm via its hot-sync port and start typing. The keyboard software lets you control any Palm application and even assign menu commands and shortcuts to customizable buttons and function keys. Although GoType is only about three-quarters the size of a large notebook keyboard, its keys are spaced far enough apart to accommodate touch typing.

While purchasing a keyboard for a device designed to be used *without* a keyboard might seem ironic, GoType definitely beats Graffiti or a soft (on-screen) keyboard when you have a lot of text to type. Because the Palm was designed as a portable companion, the unit has no printer support.

Stevens Creek Software's $40 **PalmPrint 2.2** adds this versatility. With it, Palm devices equipped with infrared ports can print—without any extra drivers—to most infrared-equipped printers (including devices from Canon, Citizen, and Hewlett-Packard). PalmPrint also connects to the printer with optional printer cables. In my tests with a Canon BJC-80 portable ink jet printer, I printed a memo simply by pointing the Palm's infrared beam at the printer. PalmPrint comes with the handy SnailMailer utility, which sends mailing-list data and individual addresses from the Palm to the printer in mailing-label format.

- **LandWare;** 800/526-3977; www.landware.com

PRODUCT INFO NO. 765

- **Stevens Creek Software;** 800/723-4279; www.stevenscreek.com

PRODUCT INFO NO. 766

—Michael S. Lasky ■

FOR MORE information on the wide range of third-party Palm products, check out the Palm resource guide at PC World Online (www.pcworld.com/aug99/palm_resources).

PHOTOGRAPH: MARC SIMON

THE BEST ENGINEERED COMPUTERS YOU CAN BUY WERE JUST AWARDED 3 BEST BUYS.

intel inside
pentium® III PROCESSOR

All in June 99, Quantex won three Best Buy Awards from PC World—one in the "Power Desktops" category and two in the "Budget Desktops" category. Our QP6/500 SM-4x SE PC World Best Buy, QP6/400 M-1c PC World Best Buy and QP6/400 M-4x SE PC World Best Buy all ranked in the top five in their respective categories, with the QP6/400 M-1c PC World Best Buy grabbing the #1 Best Buy spot.

BEST POWER.
BEST PERFORMANCE.
BEST VALUE.

THE QUANTEX **QP6/550 SM-4X SE**, MUCH MORE THAN THE SUM OF ITS PARTS.

Pentium® III processor 550MHz—turbo charged power and speed for next-generation Internet technology.

***NEW* nVidia Riva TNT2**—explosive 3D rendering, ultra-fast 128-bit 2D engine, ultra-high resolution display; 32MB; TV-Out.

CD-Rewriteable Drive—incredible fast max variable speed reading, recording function for creating CDs, storing and transporting files.

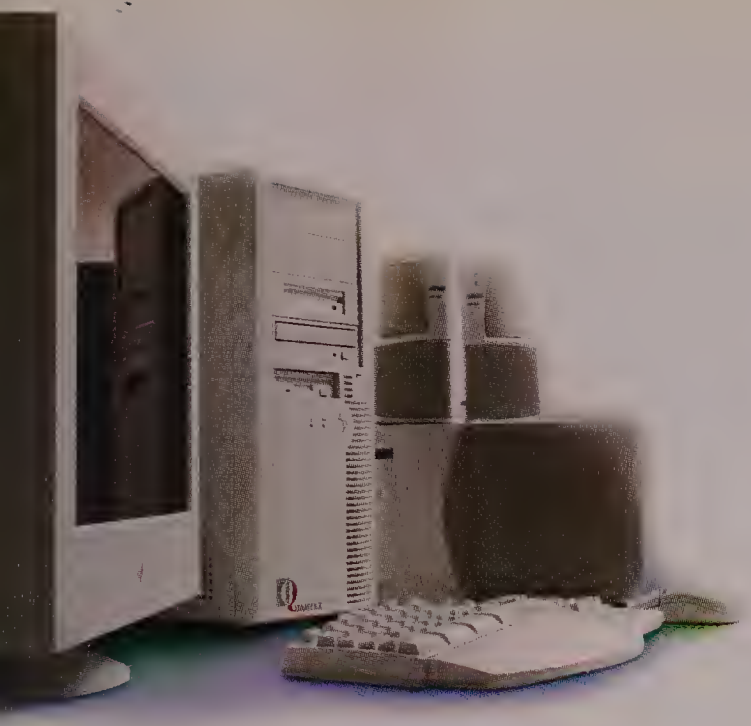
18GB Hard Drive—7200rpm high-performance, ultra-reliable storage; Ultra ATA.

Aureal Vortex2 Sound—heart-pounding, ultra-realistic sound with A3D 2.0 Wavetracing technology, support for next-generation 3D audio technology.

Actual component placement may vary.

intel inside
pentium® III PROCESSOR

Quantex introduces a blazing Intel Pentium® III processor-based system with the smartest array of components available anywhere.



With its raw Pentium® III processor 550MHz, nVidia Riva TNT2 graphics, and Vortex2 sound, the Quantex QP6/550 SM-4x SE redefines the term "Power Desktop".

POWER DESKTOPS BEST BUY, QP6/500 SM-4X SE—*PC WORLD* JUNE 1999
"This powerful Pentium III-500 [Pentium® III processor-based 500MHz] PC brings an embarrassment of riches to the desktop, with just about everything a small workgroup or home office might need..."

BUDGET DESKTOPS BEST BUY, QP6/400 M-1C—*PC WORLD* JUNE, JULY 1999
"PC hunters looking for a budget small-office/home-office system will be hard pressed to do better than Quantex's new Celeron-400 [Intel Celeron™ processor-based 400MHz] PC."

WORLD CLASS AWARD "BEST HOME DESKTOP PC", QP6/M-1C—*PC WORLD* JULY 1999
"...these PCs give you outstanding performance for the price."

Reviewed configurations may differ from advertised configurations.

POWER DESKTOPS

Common Features: ✔ 512KB Secondary Cache ✔ 3.5" 1.44MB Floppy Drive ✔ US Robotics 56K V.90 Winmodem* w/Telephony ✔ Quantex ATX Mid Tower Case ✔ *New* Internet-ready, Multi-function Keyboard ✔ MS IntelliMouse ✔ 3-Year Limited Warranty ✔ 24/7 Toll-Free Technical Support

QP6/550 SM-4x SE

- *New* Intel® Pentium® III Processor 550MHz
- 128MB PC100 SDRAM Memory (768MB Max)
- 18GB 7200rpm Ultra ATA Hard Drive
- 19" Monitor w/Diamondtron Flat CRT (18" vis)
- *New* nVidia Riva TNT2 32MB AGP Graphics; TV-Out
- CD-Rewriteable Drive
- 6x Max Variable Speed DVD-ROM Drive
- 10/100Mb Ethernet, Cable Modem Ready
- Aureal Vortex2 Sound, A3D 2.0 Technology
- Altec Lansing ADA-305 Dolby Pro Logic Surround Sound Speakers, Subwoofer
- MS Windows 98 2nd Ed; *New* MS Office 2000 SBE

$2499
Business lease:$90/Mo., 36 Mos. $0 Money Down
Q-QUOTE NUMBER: pcw08s20

QP6/500 SM-3x

- Intel® Pentium® III Processor 500MHz
- 128MB PC100 SDRAM Memory (768MB Max)
- 17GB Ultra ATA Hard Drive
- 19" Monitor w/Diamondtron Flat CRT (18" vis)
- 3Dfx Voodoo3 3000 AGP Graphics w/16MB; TV-Out
- Internal 100MB Zip Drive
- 6x Max Variable Speed DVD-ROM Drive
- Aureal Vortex2 Sound, A3D 2.0 Technology
- Altec Lansing ACS-45.1 PowerCube Speakers, Subwoofer
- MS Windows 98 Second Edition
- *New* Microsoft Office 2000 SBE
- *Optional Canon MPC-3500 Printer, add $299*

$1999
Business lease:$72/Mo., 36 Mos. $0 Money Down
Q-QUOTE NUMBER: pcw08s06

QP6/500 SM-2x

- Intel® Pentium® III Processor 500MHz
- 128MB PC100 SDRAM Memory (768MB Max)
- 13GB Ultra ATA Hard Drive
- 17" Monitor w/CromaClear CRT (16" vis)
- 3Dfx Voodoo3 2000 AGP Graphics w/16MB
- 6x Max Variable Speed DVD-ROM Drive
- Aureal Vortex2 Sound, A3D 2.0 Technology
- Altec Lansing ACS-90 Speakers
- MS Windows 98 Second Edition
- *New* Microsoft Office 2000 SBE
- *Optional Epson Stylus 740 Inkjet Printer, add $239*
- *Call for specials on scanners, cameras and more!*

$1699
Business lease:$61/Mo., 36 Mos. $0 Money Down
Q-QUOTE NUMBER: pcw08s03

QP6/450 SM-1x

- Intel® Pentium® III Processor 450MHz
- 64MB PC100 SDRAM Memory (768MB Max)
- 10GB Ultra ATA Hard Drive
- 17" Monitor w/CromaClear CRT (16" vis)
- 3Dfx Voodoo3 2000 AGP Graphics w/16MB
- 40x Max Variable Speed CD-ROM Drive
- Aureal Vortex2 Sound, A3D 2.0 Technology
- Altec Lansing ACS-90 Speakers
- MS Windows 98 Second Edition
- *New* Microsoft Office 2000 SBE
- *Optional 36-bit Color Scanner, add $99*
- *Call for daily upgrade specials on this package!*

$1399
Business lease:$50/Mo., 36 Mos. $0 Money Down
Q-QUOTE NUMBER: pcw08s14

VALUE DESKTOPS

Common Features: ✔ 3.5" 1.44MB Floppy Drive ✔ 512KB Secondary Cache (128KB Cache w/Intel® Celeron™ Processor-based PCs) ✔ Quantex ATX Mid Tower Case ✔ 104-Key Keyboard ✔ MS Mouse ✔ 3-Year Limited Warranty ✔ 24/7 Toll-Free Technical Support

QP6/500 M-4x SE

- Intel® Pentium® III Processor 500MHz
- 128MB PC100 SDRAM Memory
- 13GB Ultra ATA Hard Drive
- 19" Monitor w/on-screen display (18" vis)
- *New* S3 Savage4 2D/3D AGP Graphics; 32MB
- 3rd Generation DVD-ROM Drive
- 56K V.90 Telephony Fax/Modem*
- SoundBlaster AudioPCI 64V 3D Sound
- 3-piece Dynamic Stereo Speakers, Subwoofer
- MS Windows 98 2nd Ed; *New* Corel WordPerfect Office 2000

$1699
Business lease:$61/Mo., 36 Mos. $0 Money Down
Q-QUOTE NUMBER: pcw08m10

QP6/450 M-3x

- Intel® Pentium® III Processor 450MHz
- 64MB PC100 SDRAM Memory
- 10GB Ultra ATA Hard Drive
- 17" Monitor w/on-screen display (15.8" vis)
- *New* S3 Savage4 2D/3D AGP Graphics; 16MB
- Internal 100MB Zip Drive
- 3rd Generation DVD-ROM Drive
- 56K V.90 Telephony Fax/Modem*
- SoundBlaster AudioPCI 64V 3D Sound, Speakers
- MS Windows 98 2nd Ed; *New* Corel WordPerfect Office 2000

$1299
Business lease:$64/Mo., 24 Mos. $0 Money Down
Q-QUOTE NUMBER: pcw08m07

QP6/466 M-2c

- Intel® Celeron™ Processor 466MHz
- 64MB SDRAM Memory
- 10GB Ultra ATA Hard Drive
- 17" Monitor w/on-screen display (15.8" vis)
- Intel 2D/3D Graphics Accelerator
- 40x Max Variable Speed CD-ROM Drive
- 56K V.90 Telephony Fax/Modem*
- Dynamic Wavetable Stereo Sound, Speakers
- MS Windows 98 Second Edition
- *New* Corel WordPerfect Office 2000

$999
Q-QUOTE NUMBER: pcw08m13

QP6/400 M-1c

- Intel® Celeron™ Processor 400MHz
- 64MB SDRAM Memory
- 6GB Ultra ATA Hard Drive
- 15" Digital Monitor (13.8" vis)
- Intel 2D/3D Graphics Accelerator
- 40x Max Variable Speed CD-ROM Drive
- Dynamic Wavetable Stereo Sound, Speakers
- MS Windows 98 Second Edition
- *New* Corel WordPerfect Office 2000
- *Special Upgrade: 56K Telephony Fax/Modem*, add $49*

$799
Q-QUOTE NUMBER: pcw08m02

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WWW.QUANTEX.COM/PCWORLD

ROCK YOUR DESKTOP, RULE THE ROAD.

15" LCD Display—enormous viewing area, high-resolution support for 1024x768 XGA back-light display and 1280x1024 SXGA mode.

ATI 3D AGP Video—blazing 3D graphics, 8MB on-board SGRAM allows faster CPU performance.

***NEW* Pentium® II processor 400MHz**—innovative 256K on-die L2 cache and 9.5 watt thermal envelope boosts performance and lowers power consumption.

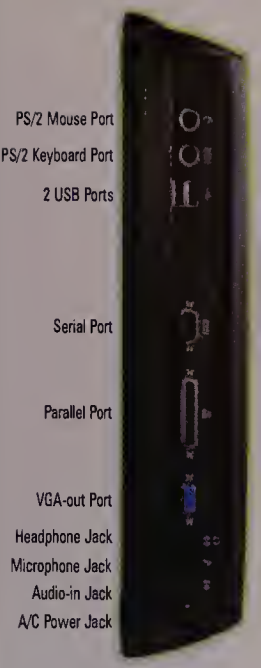
128MB SDRAM (up to 384MB max)—super-fast performance on high-end applications with plenty of room for growth.

DVD and Floppy Module—all-in-one design incorporates DVD-ROM and floppy for extreme functionality; also supports optional 2nd battery.

Actual component placement may vary.

intel inside
pentium® II PROCESSOR

The Quantex l-1511, the most powerful dual-purpose laptop available. Fast enough for the most demanding desktop applications, light enough to be the perfect road companion.



(Back of Quantex Mini-Docking Station Shown)

THE POWER TO DO EVEN MORE

Quantex Mini-Docking Station—you're just a "plug-in" away from the simplest, most versatile way to make your Quantex I-1511 double up as a desktop. Integrate your notebook with monitors, keyboards, printers, network connections and more.

Add to your notebook purchase for only $149

Notebook Upgrade Options:

- Internal Modular Zip Drive (T-Series Only)...add $149
- Quantex Mini-Docking Station...add $149
- Long-Lasting Lithium Ion Battery...add $129
- PCMCIA Network Interface Card...add $129
- Quantex Deluxe Carrying Case...add $89
- Upgrade from 64MB to 128MB SDRAM...add $149
- Upgrade from 6GB to 10GB Hard Drive...add $249
- Toshiba PDR-M1 Digital Camera...add $399
- Targus Defcon1 Security Lock...add $69
- Canon BJC-80 Portable Printer...add $299

I-SERIES "DESKTOP REPLACEMENT" NOTEBOOK

Common Features: ✔ 256K Performance Enhanced On-Die Cache ✔ ESS 3D Wavetable Sound, Speakers ✔ Smart Lithium Ion Battery ✔ TV-Dut ✔ Personal Touchpad ✔ USB, Fast IR Ports ✔ **Quantex Deluxe Carrying Case** ✔ 3-Year Limited Warranty ✔ 1-Year Parts and Labor Limited Warranty ✔ 24/7 Toll-Free Technical Support

Quantex I-1511

New Intel® Pentium® II Processor 400MHz
15" XGA Active Matrix Display
128MB SDRAM Memory
10GB Ultra ATA Hard Drive
56K V.90 Fax/Modem*
New Modular 4x Max Variable Speed DVD-ROM Drive & 3.5" Floppy Combo Drive
ATI Rage Lt Pro 3D AGP Video w/8MB
MS Windows 98
New Microsoft Office 2000 SBE

$3199
Business lease:$109/Mo., 36 Mos. $0 Money Down
Q-QUOTE NUMBER: pcw08i20

Quantex I-1510

Intel® Pentium® II Processor 366MHz
15" XGA Active Matrix Display
64MB SDRAM Memory
6GB Ultra ATA Hard Drive
56K V.90 Fax/Modem*
New Modular 4x Max Variable Speed DVD-ROM Drive & 3.5" Floppy Combo Drive
ATI Rage Lt Pro 3D AGP Video w/8MB
MS Windows 98
New Corel WordPerfect Office 2000

$2599
Business lease:$94/Mo., 36 Mos. $0 Money Down
Q-QUOTE NUMBER: pcw08i08

Quantex I-1410

Intel® Pentium® II Processor 366MHz
14.1" XGA Active Matrix Oisplay
64MB SDRAM Memory
6GB Ultra ATA Hard Drive
56K V.90 Fax/Modem*
New Modular 4x Max Variable Speed DVD-ROM Drive & 3.5" Floppy Combo Drive
ATI Rage Lt Pro 3D AGP Video w/8MB
MS Windows 98
New Corel WordPerfect Office 2000

$2399
Business lease:$86/Mo., 36 Mos. $0 Money Down
Q-QUOTE NUMBER: pcw08i06

Quantex I-1400

Intel® Pentium® II Processor 333MHz
14.1" XGA Active Matrix Display
32MB SORAM Memory
4GB Ultra ATA Hard Drive
56K V.90 Fax/Modem*
Modular 24x Max Variable Speed CD-ROM Drive & 3.5" Floppy Combo Drive
ATI Rage Lt Pro 3D AGP Video w/8MB
MS Windows 98
New Corel WordPerfect Office 2000

$1999
Business lease:$72/Mo., 36 Mos. $0 Money Down
Q-QUOTE NUMBER: pcw08i01

T-SERIES "MOBILE WARRIOR" NOTEBOOK

Common Features: ✔ 256K On-Die Cache ✔ 3.5" Modular Floppy Drive ✔ Smart Lithium Ion Battery ✔ Personal Touchpad ✔ USB, Fast IR Ports ✔ Integrated 16-bit Stereo Sound, Speakers ✔ 3-Year Limited Warranty ✔ 1-Year Parts and Labor Limited Warranty

Quantex T-1411

Intel® Pentium® II Processor 366MHz
Ultra-Thin Design (12.44"x9.84"x1.43")
14.1" XGA Active Matrix Display
128MB SDRAM Memory
6GB Ultra ATA Hard Drive
Modular 4x Max Variable Speed DVD-ROM Drive
56K V.90 Fax/Modem*
NeoMagic NMG5 128-bit AGP Video
Quantex Carrying Case
MS Windows 98
New Microsoft Office 2000 SBE

$2499
Business lease:$90/Mo., 36 Mos. $0 Money Down
Q-QUOTE NUMBER: pcw08t11

Quantex T-1401

Intel® Pentium® II Processor 366MHz
Ultra-Thin Design (12.44"x9.84"x1.43")
14.1" XGA Active Matrix Display
64MB SDRAM Memory
6GB Ultra ATA Hard Drive
Modular 24x Max Variable Speed CD-ROM Drive
PCMCIA 56K Fax/Modem*
NeoMagic NMG5 128-bit AGP Video
Quantex Carrying Case
MS Windows NT Workstation 4.0
Optional Internal Zip Drive...add $149

$2299
Business lease:$83/Mo., 36 Mos. $0 Money Down
Q-QUOTE NUMBER: pcw08t15

INTRODUCING

B-SERIES "NO-COMPROMISE AFFORDABILITY" NOTEBOOK

Common Features: ✔ 128K On-Die Cache ✔ Modular 3.5" Floppy Drive ✔ Smart Lithium Ion Battery ✔ Personal Touchpad ✔ USB, Fast IR Ports ✔ Integrated 16-bit Stereo Sound, Speakers ✔ 3-Year Limited Warranty ✔ 1-Year Parts and Labor Limited Warranty

NEW Quantex B-1211

Intel® Celeron™ Processor 400MHz
12.1" TFT Active Matrix Display
64MB SDRAM Memory
6GB Ultra ATA Hard Drive
56K V.90 Fax/Modem*
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Emergency Management Port
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intel inside
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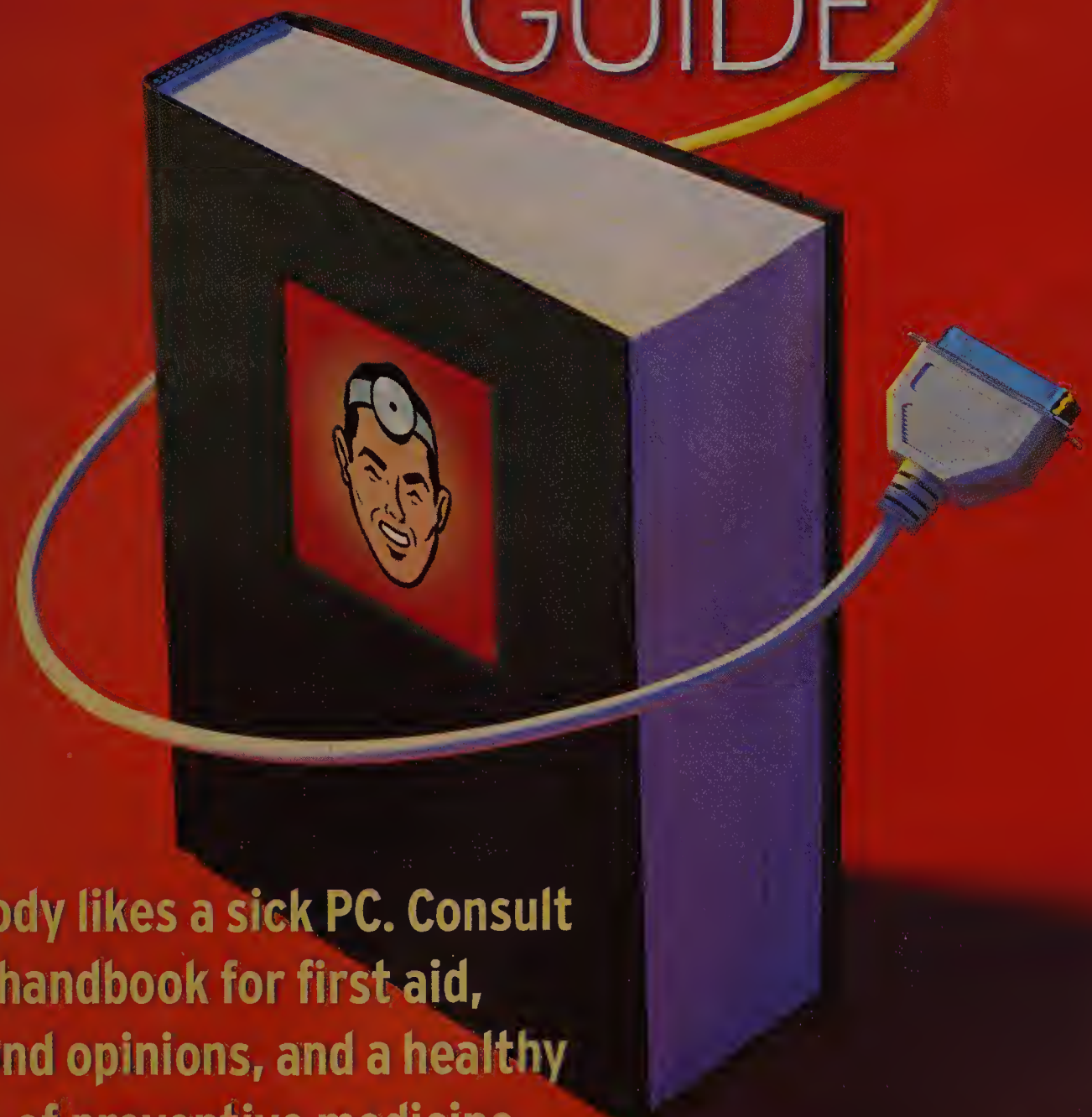
THE COMPLETE PC CARE GUIDE



Nobody likes a sick PC. Consult this handbook for first aid, second opinions, and a healthy dose of preventive medicine.

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THE FIX IS IN: TOP WINDOWS UTILITIES → 152

Trouble

Our PC specialist gives you more than just the FAQs.

Here's fast relief for your most vexing hardware headaches.

INSIDE

shooting IS MY BUSINESS

BY KIRK STEERS

GOOD HELP is hard to find, especially when your PC knocks off without warning. You know the computer expert at your office won't answer your e-mail for at least a day. And the last thing you want to do is drop 35 bucks on some bored phone technician who leads you through an hour's worth of mostly irrelevant questions only to conclude that the problem is due to some other company's product and that you should call *its* technical support line for help.

Whew. Makes you want to dust off your abacus. But what's the alternative? Roll up your sleeves and fix it yourself.

That's right: Solutions to the most common hardware problems lie well within your grasp. You don't have to send e-mail or make any phone calls. All you need is a little guidance. And (ahem) that's where Doctor Kirk takes charge. I dispense guidance every month in my *Hardware Tips* column.

This month, I've vacated my usual position in the back of the magazine in favor of this plum territory, to give you intensive help with some of the most prevalent hardware maladies. I scoured newsgroups, talked with support techs, and polled other *PC World* experts to figure out which hardware issues trip people up the most. Is it the 32MB of RAM that keeps running low? Or

PHOTOGRAPHS: PETE McARTHUR; ILLUSTRATIONS: MARK MATCHO

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the colossal hard drive that behaves as if it were pint-size? Maybe it's a hot new graphics card that performs no better than your old cruddy one.

For each hardware glitch, I've crafted diagnoses and prescribed procedures to help you solve it on your own. Don't be nervous, this won't hurt a bit. Just prepare to familiarize yourself with such inner workings of your system as the CMOS program, for therein lies the answer to many a hardware riddle.

Now, I don't claim to cover every possible hardware problem in the coming pages. Nor can I guarantee that my prescriptions will cure your PC's specific ailment. But start here, and when your frustration level approaches its board-snapping peak, follow my golden rule: Know when to give up. Troubleshooting your computer yourself has its benefits, but at some point you may have to send that e-mail or make that phone call.

System Basics

OVERHEATED

Q Every now and then, my monitor goes blue, my hard drive slows down, and my system locks up. Any suggestions?

A How about splurging on an air conditioner? Other than a squirt gun filled with salt water, heat is your PC's worst enemy. Prolonged exposure to excessive heat can prematurely age or destroy your system. Blue screens and sluggish hard drives are classic warning signs of overheating and should be dealt with immediately.

Start by removing dust that's accumulated on your PC. Clogged ventilation openings can raise the interior's temperature. Check inside your system, too; a layer of dust can act as an insulator, heating up chips and circuits. Use compressed air in a can (and a Dust Buster, if it's a big job); never clean circuitry with water or detergent. If you must wipe the interior, use an antistatic wipe.

Finally, make sure all your cooling fans work properly. A dying power-supply fan will make lots of noise when it's foundering, but a small CPU fan may not complain audibly—and if your CPU fan expires, the subsequent overheating can ruin your CPU. The BIOS for most Pentium II PCs monitors each fan's RPM and issues an error message if it drops to a dangerous level. Confirm that this feature is turned on in your CMOS setup program.

For older systems that lack fan-monitoring features, consider installing a temperature monitor. PC Power and Cooling's 110 Alert costs only $17 and sounds an alarm when your PC's internal temperature rises above 110 degrees Fahrenheit. It will also alert you when your CPU fan falters.

- **110 Alert** $17 list; PC Power and Cooling; 800/722-6555; www.pcpowercooling.com

PRODUCT INFO NO. 662

UNDERPOWERED

Q I just added a second hard drive, a Zip drive, and a CD-RW drive to the Pentium II-233 system I put together. But now the box feels very hot to the touch. Have I overloaded my system?

A See, you didn't even need me to tell you. When you present your PC's power supply with a bunch of demanding new components to run, you don't want it to warm to the task—because that's a sign that the power supply is working overtime. Most power supplies have a wattage of 145, which may not be enough. If you bought a cheap box, it probably contained a weak power supply. This can lead to nagging, intermittent problems and dangerous overheating. The solution: a new power supply. Look at the wattage listed on your current power supply. Now, figure an additional 25W for the extra hard drive and 10W more for each of the other new devices. Add that quantity to the wattage listed on your current power supply, then tack on another 20 percent. Now go shopping.

WHAT'S MY PASSWORD?

Q I set up a new system password to enter whenever I turn on my computer, but I must have mistyped it because I can't start my computer anymore. Is there any way to reset the password?

CHECKLIST

I've Crashed and I Can't Get Up (and Running)

NOTHING PROMPTS A healthy jolt of adrenaline like starting up your PC on a busy morning and having it freeze—or worse, show little sign of life. If that happens, think positive and follow these tips:

1 **Check the obvious.** Are all of your system's cables connected, and is everything plugged in?

2 **Look for clues.** Restart the PC and carefully watch your monitor for clues to a hardware failure. When a component successfully initializes, a confirmation message usually flashes on the screen. If a part is malfunctioning, your PC may display a failure message hinting at the problem.

3 **Be safe.** Start Windows in Safe mode, by holding down <F8> just before Windows boots. Select *Safe Mode* from the Windows Startup Menu to load a bare-bones OS without drivers or start-up programs.

4 **Boot again.** If the PC boots in Safe mode, reboot, return to the Windows Startup Menu, and choose *Step-by-step confirmation*. This will load one driver at a time. With luck, you'll be able to identify which driver or component is acting up.

5 **Read the log.** If the PC is still struggling, reboot, go to the Windows Startup Menu, and choose *Logged (\bootlog.txt)*. This generates a log file called bootlog.txt in your root folder that will record each step of the boot process and confirm its success or failure.

6 **Get on the horn.** Though the log file is pretty technical, examining it with a text editor may provide clues to the lay user. And if not, it will still be invaluable to a support technician.

A The system password you're talking about is stored in your CMOS, a little program that manages many of your computer's functions (see "The Underbelly of the Beast," below). Unfortunately, losing your CMOS password is like dropping your keys down the waste disposal: You've got a messy job ahead of you, and you'd better hope no one flips the power switch on.

There's no easy way to get around a lost or forgotten CMOS password. You might try calling your system maker or the BIOS manufacturer and asking whether the PC has a default password. If not, you'll have to spend some time inside your system (see "I'm Goin' In," page 129). Check your system manual for a motherboard jumper to reset your password. If there isn't one, look for a jumper to reset your entire CMOS. As a last resort, you can remove the small battery on the motherboard that maintains your CMOS settings. But beware: Once you scrub your CMOS settings, you have to reset them manually.

OUT OF MEMORY

Q Sometimes when I'm working in Windows, opening and closing programs, I get a message announcing that I have insufficient memory. My system already has 32MB of RAM. Do I need more?

A Not necessarily. You may have a memory leak. Sometimes, when a software program closes, it doesn't let go of the memory it was using, so Windows doesn't know it's available. This was a much bigger problem in Windows 3.*x* than it is in Windows 95/98, but it still happens. The only way to correct the problem is to reboot your PC. And if you can figure out which program is hogging the memory, you may want to reinstall it, just in case the program has become corrupted over time.

THE UNDERBELLY OF THE BEAST

LURKING BELOW the colorful screens and perky icons of Windows is your BIOS, a small piece of software that's packed with low-level instructions to control the most basic parts of your PC. While the BIOS knows how to, say, read both a 720KB and a 1.44MB disk, it doesn't know which kind of drive your system has (or whether you have a floppy drive at all). The BIOS needs to be told such things when the PC is turned on. That information is stored in your CMOS (complementary metal oxide semiconductor) settings. The CMOS settings rest on a small battery-powered chip that runs even when the PC is turned off. These days, every BIOS has a CMOS setup program, which you can use to configure and troubleshoot your PC's basic components.

How you get to your CMOS setup program varies. On most PCs a message pops up on your screen when you power up, telling you to press <DEL>, <F1>, or another key in order to launch the program. If you don't see a message, check your user manual for help.

Not all CMOS setup programs look the same, either. Different BIOS makers use different terms for the same settings. But you'll easily recognize most of the settings you need to access. In case you aren't sure about a particular setting, many PCs come with a system or motherboard manual that briefly explains them all.

The rule of thumb when you're working in CMOS: Don't burn your bridges. Accidentally changing a setting could compromise or halt your PC's operation . When you enter the setup program, find the 'Exit Without Saving Changes' (or equivalent) choice. Thereafter, if you have the slightest suspicion that you've changed an unfamiliar setting, use that option as a get-out-of-jail-free card.

To be safe, back up your CMOS settings before you fiddle with them. Various programs can do this for you, including Norton Utilities. You can always write the settings down by hand, too.

Be leery of any option along the lines of 'Load BIOS Defaults'. You can't know whether these defaults will return your settings to their optimal values. PC manufacturers tweak BIOS settings to suit individual PCs and custom configurations.

Finally, the only way to solve some hardware conflicts is to update your BIOS with the manufacturer's latest version. Most PCs nowadays contain a flash BIOS that allows updates via a downloadable software program you can obtain from your system's manufacturer. You can identify which BIOS version your computer currently uses by watching the screen during boot-up.

YOUR CMOS program knows the inner workings of your computer.

```
ROM PCI/ISA BIOS ((P5HX-B))
  STANDARD CMOS SETUP
  AWARD SOFTWARE, INC.

Date (mm:dd:yy) : Tue, Mar  9 1999
Time (hh:mm:ss) : 18 :  0 : 33

HARD DISKS          TYPE   SIZE

Primary Master    : Auto      0
Primary Slave     : Auto      0
Secondary Master  : Auto      0
Secondary Slave   : Auto      0

Drive A : 1.44M, 3.5 in.
Drive B : None
Floppy 3 Mode Support : Disabled

Video   : EGA/VGA
Halt On : All Errors

ESC : Quit                  | | → ←  :
F1  : Help                (Shift)F2 :
```

Locating the source of the trouble can be tough. Fortunately, Windows 9*x* has a great diagnostic tool, System Monitor, that continually tracks your PC's performance in real time. To run System Monitor, go to the System Tools menu (select *Start•Programs•Accessories•System Tools*). If System Monitor isn't there, install it from the Windows 9*x* CD-ROM via *Add/Remove Programs* in Control Panel.

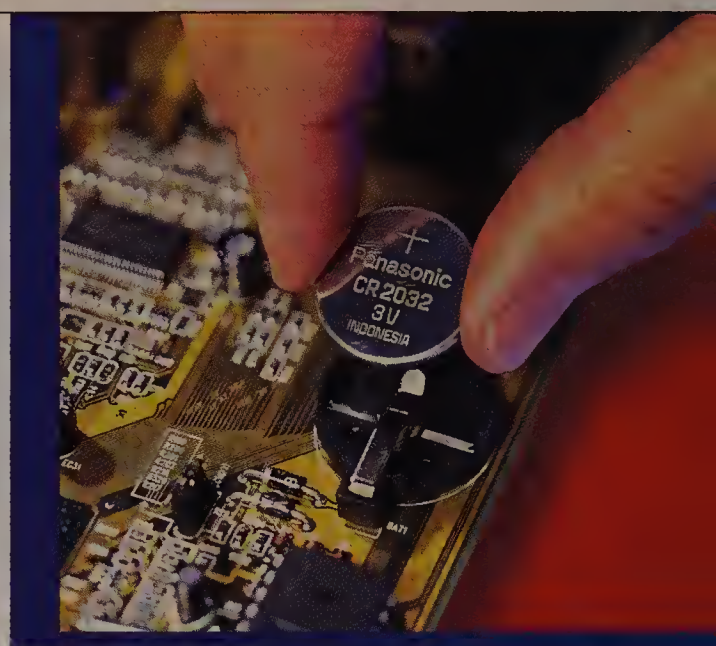
Select *Numeric Charts* and *Always on Top* from the View menu to place a small window on your desktop. Then from the System Monitor's Memory Manager menu (select *Edit•Add Item•Memory Manager* to access it), pick the performance statistics you want to display. Keep an eye on three indicators—*Unused physical memory, Swapfile in use,* and *Swapfile size*—as you open, use, and close different applications. This will help you identify sources of leaks. Also watch the Threads statistic, reachable through *Edit•Add Item•Kernel•Threads*. It should expand or shrink with the number of running programs. If it increases regardless of what you do, you may have a leak.

DYING BATTERY

Q When I leave my system off for more than a couple of hours, my clock starts losing time. Is my PC slowing down? Is my watch speeding up? Is Superman turning back time?

A Hey, I'm the Superman of hardware tips around here. In a manner of speaking, your PC *is* a little sluggish. A small battery on the motherboard powers your PC's clock when the system is turned off. A slow clock means the battery needs to be replaced. If the battery dies completely, you risk losing all those important settings in your CMOS program, because the battery runs it, too.

Check the user manual for the type of battery you have and its location on the motherboard. In most instances, it's a small, camera-style battery that is easy to swap in. Even if the battery is wired to the motherboard, you can probably attach a replacement battery to a nearby connector. Just remember to save all your CMOS settings before changing the battery; you may lose them when you make the switch.



EVER WONDERED how your PC keeps time even after you've shut it off? Well, like your watch, it has a tiny battery which keeps your CMOS program ticking around the clock. But if the battery dies, your settings are in peril.

Storage

LOST CLUSTERS

Q I accidentally hit my PC's off button without properly shutting down Windows. The next time I started my PC, ScanDisk found lost clusters and cross-linked files and asked whether I wanted to save them. Do I?

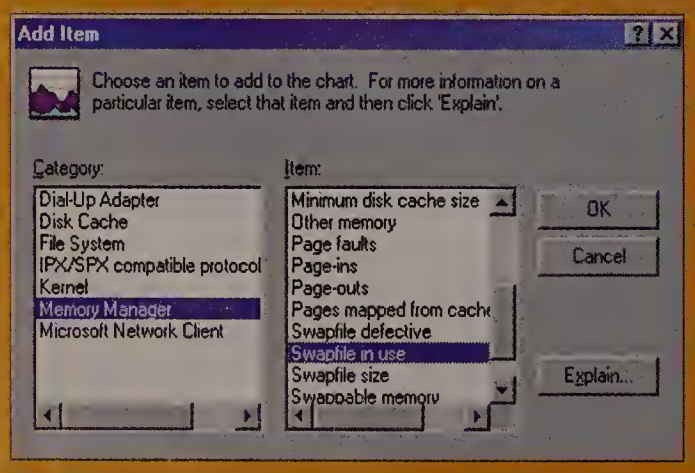
A Maybe, maybe not. Do you still have the invite to your high school prom? After an improper shutdown, ScanDisk often finds lost clusters or cross-linked files. Both problems are just bookkeeping errors in your hard disk's File Allocation Table and don't reflect physical damage on the disk's surface.

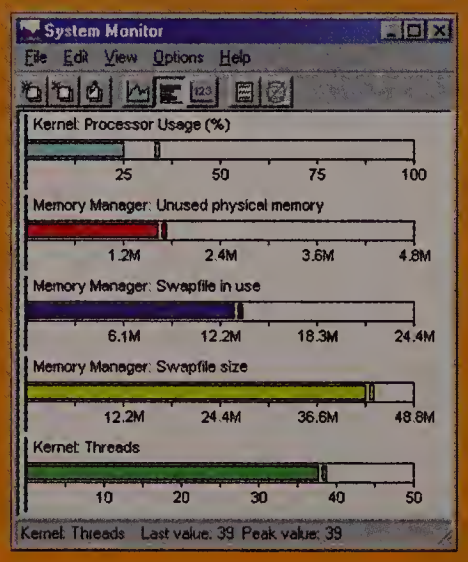
All files on your hard drive are broken into numerous small segments called *clusters*. Lost clusters are simply clusters that are no longer linked to an existing file. Unless you're afraid you might have lost a critical file that you had open during a system crash or power failure, you needn't convert lost clusters to files; they're almost always trash. The same goes for invalid clusters. Just delete them.

A cross-linked file is one that—according to your hard disk's FAT—shares a cluster with another file. ScanDisk will offer to create two separate files, each with its own copy of the disputed cluster. And accepting that offer is your best option.

If you suspect that your hard disk is damaged, run ScanDisk. To do this, click *Start•Programs•Accessories•System Tools•ScanDisk* and select the *Thorough* option. The utility will then perform a complete surface scan to check for physical damage. (Warning: This process can take hours, depending on the size of your hard disk. Keep a book handy.) You can expect to generate a few bad sectors through normal wear and tear. But if you constantly discover lots of new bad sectors—and if they appear with increasing frequency—you may have a big problem. Back up your data immediately and get yourself a new hard disk.

USE SYSTEM MONITOR'S ADD ITEM MENU to choose the areas of system performance you want to track. Then you can use the utility to see if your PC is leaking memory.





PHOTOGRAPH (TOP): KEVIN CANDLAND

VIRTUAL MEMORY SHORTAGE

Q For years I've used the same PC and applications, but recently I've been getting 'insufficient memory' messages when I open some spreadsheets. I haven't changed what I do, so what's happening to my memory?

A Aha! Trick question. This doesn't sound like a memory problem at all. Instead, after all these years, you're probably running out of hard disk space. Windows needs extra hard disk space to handle your swap file—the special place where data goes when RAM gets used up. If you run big spreadsheets or multiple apps when your hard disk is almost full, your swap file can't work properly.

You have two choices: Free up disk space by deleting or moving files, or move the swap file to a partition or to an additional hard disk that has more room. To move the swap file, right-click *My Computer*, select *Properties*, and click the *Performance* tab in the System Properties dialog box. Click the *Virtual Memory* button, and select *Let me specify my own virtual memory settings*. The 'Hard disk' box will list all available partitions and disks and show the free space on each.

HONEY, I SHRUNK THE DISK

Q I purchased what I thought was a 2GB EIDE hard drive and installed it in my new Pentium II system. I installed it using autodetect in the CMOS setup program, but Windows sees it as only a 504MB drive. Did I get ripped off?

A No, Scully, you didn't. But you know what they say: "Trust no one, not even yourself." The likeliest scenario is that you installed the hard drive incorrectly in the CMOS setup program. So go back to your CMOS autodetect program and try reinstalling the drive. The program should offer you several configuration choices for your drive. Last time, I suspect, the configuration you chose told your computer to treat the new drive like an old IDE drive (which has a size limit of 504MB). This time, choose the option with LBA, or Logical Block Addressing. LBA allows your PC to configure drives that are larger than 504MB.

MASTER AND SLAVE

Q I can't get my system to recognize my new hard drive. I installed it on the same EIDE cable that controls my first drive and tried to set it up in CMOS, but I've had no luck at all.

A No luck? No problem. When you connect two hard drives or other EIDE devices to the same cable, one device must be designated as "master" and the other as "slave." If your original drive is your boot drive, it's set as the master drive. Chances are your new drive is also set as master, and that's why your system can't see it. To correct this problem, all you have to do is change the jumper on the new drive to the slave setting. You should be able to find the jumper settings marked on the drive housing or identified in the documentation that accompanied the drive. If the settings are not written on the housing, take a permanent marker and write them there so you can refer to them quickly in the future.

BOOT-UP CAMP

Q I want to boot my system using my emergency start-up disk. I inserted the floppy into the drive and booted up, but Windows continues to launch from my hard disk. Do I have to disable my hard disk to override this?

A Don't disable your hard disk. Instead, check your boot drive settings in your system's CMOS setup program. Look for the Boot Sequence setting or something similar. It's probably set to 'C:, A:', meaning that your system looks to the C: drive first when booting up and then looks to the A: drive. Change this setting to 'A:, C:'. Most new computers come with a BIOS that also lets you set up a Zip, LS-120, or CD-ROM drive as the primary boot drive. ▶

CHECKLIST

I'm **Goin' In**

WHEN YOU CHOOSE to fix your own hardware problems, sooner or later you'll have to pop the top off your system and get your hands dirty—or at least dusty. But don't take the leap until you do the following:

1 **Unplug.** Just shutting off the main power supply won't do. Many systems continue to pipe a little juice through, even when turned off. To be safe, disconnect your modem and network cables, too.

2 **Get organized.** Visualize grappling with a snake inside your PC. You need room to wrestle expansion cards and memory chips. Can you see everything?

3 **Get grounded.** Your body can build up enough static charge to fry the delicate circuits found in your computer. Your best protection is to wear a grounding strap on your wrist, which you can buy at most electronics shops. At the very least, touch your hand to the PC's metal case before handling any circuit.

4 **Jeez, be careful.** When you're pushing and pulling add-in cards, don't forget that circuit boards are delicate. And *never* twist an expansion card. Seating cards in expansion slots sometimes requires a bit of force, but make sure you apply it gradually.

5 **Use a real tool.** Don't attempt to work on your computer with such low-tech gizmos as a Swiss Army Knife and a paper clip. You may not have the leverage to turn stubborn screws and you could slip, hurting yourself (some things in there are sharp) or your PC.

BAD FLOPPIES, BAD, BAD

Q I ran ScanDisk on several floppy disks that I use to back up old files and found a number of bad sectors, so I copied the data to new disks. If I reformat the old disks, can I safely reuse them?

A Theoretically, yes. But you'd be crazy to try it. When any floppy disk—especially one that's a couple of years old—shows signs of trouble, copy its data to a new disk and throw it away.

HARD DRIVE TOO BIG?

Q I just added a 4GB hard drive to my Pentium-166 system running Windows 95. But I'm having all kinds of trouble getting Windows to recognize the drive. What's up with that?

A For starters, check with your system vendor to ensure that your BIOS can support a 4GB drive. If it can't, you'll need to upgrade your BIOS, either by downloading it from your vendor's Web site or by buying a new one from a third party such as Micro Firmware.

If your BIOS isn't the issue, the culprit may be the file allocation system your PC uses to organize the files on your hard disk. As you may know, FAT16 can't support partitions—the portion of a hard drive defined by one drive letter—larger than 2GB. If you're using FAT16, you have two options: Create multiple partitions small enough for FAT16 to handle, or upgrade to FAT32. You can create two or more partitions, each no bigger than 2GB, with the DOS FDISK utility—if the hard disk is empty. If your drive contains data, you'll need a utility such as PowerQuest's $70 Partition Magic to do the job. The investment is well worth it.

Your second option is to update your disk's file system to FAT32, which supports partitions as large as 8GB. You can do this only if you have either Win 98 or the OSR2 version of Windows 95. To determine the version of Windows 95 you have, right-click *My Computer* and select *Properties*. If your version number ends with a B, you have OSR2 and you can use PartitionMagic to convert your system to FAT-32. Windows 98 has its own conversion utility.

THIS LITTLE CABLE funnels your favorite tunes directly from your CD-ROM drive to the sound card. If it's disconnected, the hills won't be alive with, well, you get the point.

- **BIOS upgrades** $59 to $79 list; Micro Firmware; 800/767-5465; www.firmware.com

PRODUCT INFO NO. 663

- **PartitionMagic** $70 list; PowerQuest; 800/379-2566; www.powerquest.com

PRODUCT INFO NO. 664

WHAT GIVES, PUSSYCAT?

Q Both my CD-ROM drive and my speakers sound fine when I play games like Flight Simulator or Tomb Raider. But when I pop in my favorite Tom Jones CD, I can't hear anything. Is there a separate volume control for audio CDs?

A Nope, but you don't need one. Your problem is likely due to a common glitch. The signal from an audio CD bypasses the inner workings of your PC via a small cable running from the CD-ROM drive to the sound card. As your favorite singer might say, it's not unusual for the cable to disconnect during shipping or to be missing altogether. Reconnect the cable (it's easy), or buy a new one for under $5 at your local computer store.

FLOPPY DRIVE SWAP

Q I just swapped in an old 5.25-inch floppy drive to copy some old disks. Everything seems properly attached, but Windows won't recognize the drive. Why?

A Here, again, you need to check your CMOS setup program. Go to the first screen in the setup program, and you should find the floppy drive settings. You'll need to change the A: drive setting from a 3.5-inch (or 1.44MB) drive to a 5.25-inch (or 1.2MB) drive. And don't forget to switch the setting back when you reinstall the 3.5-inch drive.

PHOTOGRAPH (TOP): KEVIN CANDLAND

CHECKLIST

Driver **Safety**

IT'S SAD BUT TRUE. The software driver that you got with that cutting-edge video card may already be obsolete. To obtain the best driver, make sure to heed these words of wisdom:

1. **Get the right version.** Know the exact model number and serial number of any hardware device before you go to the vendor's Web site for drivers.
2. **Don't be a guinea pig.** The *beta* in beta driver can be rearranged to spell *beat*—which is what you'll do to yourself when a beta driver crashes your system.
3. **Follow directions.** Read all the documentation you can find, and do what it says. The vendor knows the best method for installing its drivers.
4. **Uninstall old drivers first.** If you're replacing an existing card, remove the old drivers before you put in the new hardware. Go to Device Manager by right-clicking *My Computer* and selecting *Properties*. Find the old device and hit the *Remove* button. Since you can't remove a graphics card in Device Manager, change its driver to the standard Windows VGA driver (see the "Missing Cursors" tip, page 137).
5. **Never interrupt a driver installation.** Always finish installing a driver and then, if you're having second thoughts, uninstall it. Stopping in midinstallation may change or damage key system files.
6. **Forget what I just said.** If your graphics card, sound card, and so forth are working fine, why upgrade to the latest driver? Examine the details on the company's Web site to see whether there's a compelling reason to mess with Utopia.

UNZIPPED

Q I attached my external Zip drive to the pass-through parallel port on my laser printer. Why doesn't my PC detect it?

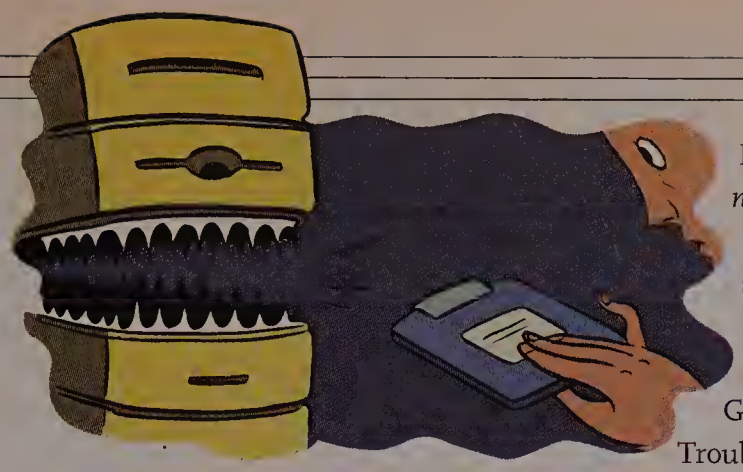
A When it comes to sharing a parallel port, Zip drives and printers get along like Microsoft and the Justice Department. Inducing them to run off the same parallel port at the same time can be tricky, if not impossible. Check the tech support page of your printer manufacturer's Web site to see whether it discusses any Zip drive compatibility problems and offers any solutions. Also check Iomega's support page at www.iomega.com/support.

If you don't find help at any of those places, try downloading and installing the latest driver for your printer. Then see whether your parallel port is working properly: Right-click *My Computer* and select *Properties*. Look under *Ports (COM and LPT)*, double-click the LPT port entry, and take a peek in the 'Device status' box to confirm that it's functioning properly. If it isn't, you'll have to contact your system vendor. If it is, your next step is to find the parallel port setting in the CMOS setup program and make sure it's not set to ECP; the EPP and Standard settings are more Zip friendly.

Another work-around that usually proves successful is to disable bidirectional support for your printer. This may disable some of your printer's communication capabilities—like the warning that tells you that you're running low on paper—but it may revive previously comatose Zip drives. To disable bidirectional support, first open the Printers folder by selecting *Start•Settings•Printers*. Next, right-click the icon for your printer and choose *Properties*. Finally, select the *Details* tab, click the *Spool Settings* button, and select *Disable Bi-directional support for this printer*.

ZIP CLICK OF DEATH

Q My Zip drive makes occasional clicking noises when it's running. I've heard about the Click of Death problem some of these drives have, and I wonder if I should be worried about damaging my disks.



A Chances are the Grim Reaper isn't knocking on your Zip drive's door. Occasional, slight clicking noises are completely normal for a Zip drive, especially when it's accessing and saving data. But if you hear a constant, loud clicking, call Iomega tech support at 888/446-6342—and don't insert any disks that contain critical data.

Another option you might consider is to run the diagnostic program accompanying your Zip drive. Just right-click the Zip drive (or removable disk) icon in Explorer, select the *Diagnostics* tab, and then choose *Diagnose now*. If you are still unsure of your drive's health, try the even better free detection utility from Gibson Research dubbed Trouble in Paradise, available at www.grc.com/clickdeath.htm or from PC World Online's FileWorld.

Graphics

3D OR NOT 3D?

Q I installed a 3D graphics card because my PC's original integrated graphics chip couldn't handle games. But the new one still won't play 3D games. How come? ▶

CHECKLIST

Lookin' for Trouble

WHEN IT COMES to your PC, you don't have to go looking for trouble; it will eventually find you. And when that happens, you'll want to dig in, identify the problem, and fix it quickly. Though several great third-party utilities do just that (see "The Fix Is In: Top Windows Utilities," page 152), these Win 95 and 98 tools are a fine place to start:

1 **Troubleshooting wizards.** Both Win 95 and Win 98 contain a number of wizards designed to help solve hardware conflicts and other problems. To see a list of available wizards, select *Start•Help*, choose the *Index* tab, and type in **troubleshooting**.

2 **Device Manager.** It's a great tool for tracking down hardware problems and for changing settings. Right-click *My Computer* and select *Properties* to find Device Manager. A yellow circle with an exclamation point warns of trouble.

3 **System Information utility.** Find this excellent Win 98 applet at *Start•Programs•Accessories•System Tools*. The utility has three sections: *Hardware Resources* gives you a picture of IRQ, DMA, and other resource assignments, plus conflicts; *Components* lists all problem devices and supplies driver information; and *Software Environment* identifies the currently running programs.

4 **System Configuration Utility.** Located under the System Information utility's *Tools* menu, this program allows you to edit, disable, and enable parts or all of your system files—such as system.ini and autoexec.bat. Doing this can help pinpoint the source of a problem.

5 **System File Checker.** Another tool housed in Windows 98's System Information utility, this application scans for corrupted or otherwise nonstandard versions of critical files. Then it helps replace the bad files with the original versions from the Windows 98 CD-ROM.

6 **Registry Checker.** Perhaps the most important of the System Information utility's programs, this checker scans your Registry and repairs certain types of problems. Its most important function, however, is to back up and restore Registry files (system.dat and user.dat) and other key files.

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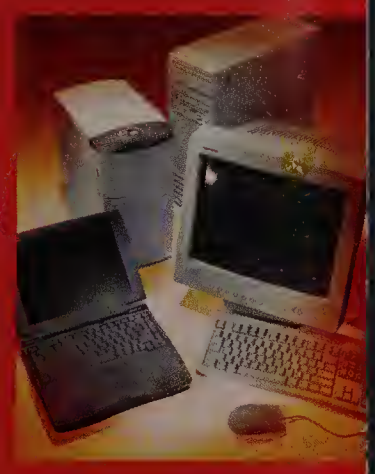

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A Surprise! Your PC is probably still using your old graphics chip. Some systems with graphics chips integrated on the motherboard can automatically detect and install a new graphics card. But others require you to disable the integrated chip by changing a jumper setting on the motherboard or changing a setting in the CMOS setup program. Watch your monitor when your PC starts up; the message on the screen usually announces the name of the graphics chip or card in use. If it doesn't display the name of your new card, you know what the problem is.

MONITOR MAYHEM

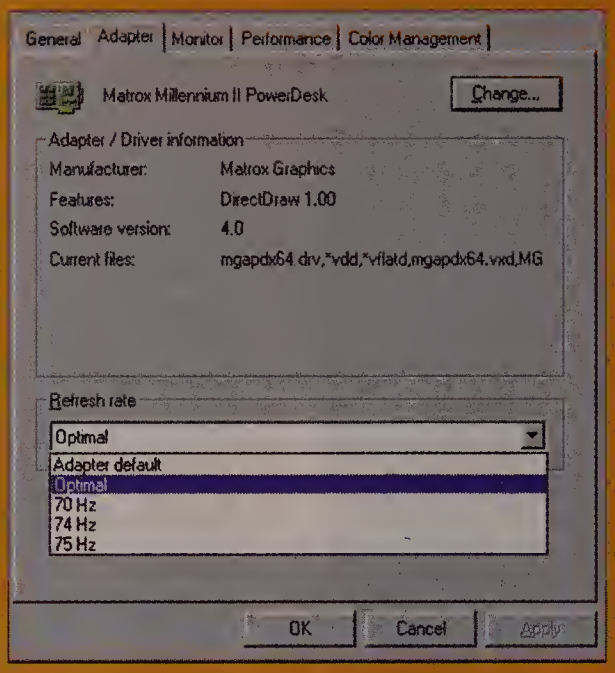
Q My monitor develops small patches of discoloration after it's been running for several hours. Is it dying?

A Probably not. If you can correct the distortion by turning your monitor off and then back on, the trouble is due to stray magnetic fields on your screen. Instead of powering down your monitor to correct this, just hit the degauss button on your monitor's control panel—it's often labeled with a small magnet. Your screen will go psychedelic for an instant and then return to normal.

THEY CALL HIM FLICKER

Q My brand-new, 19-inch monitor flickers like crazy. Can I fix this?

A Let's give it a shot. Screen flicker is a function of your monitor's vertical refresh rate—the number of times per second the monitor completely redraws the image on your screen. Any refresh rate below 70 Hz (that's 70 screens per second) may produce noticeable flicker. Conventional wisdom recommends a refresh rate of at least 75 to 85 Hz—and even higher if you spend a lot of time staring at high-resolution graphics.



BURIED IN your graphics card's display settings is a place where you can pick the most flicker-free refresh rate.

Now, let's check to see whether your graphics adapter and monitor can handle the job. To identify your adapter's refresh rate setting, first double-click the *Display* icon in Control Panel and then select the *Settings* tab. Next, click the *Advanced* button and select the *Adapter* tab. You'll see several choices at the bottom of the dialog box: Optimal, Adapter default, and (with some adapters) a set of specific refresh rates.

Not all monitors support all refresh rates, so check your monitor manual to make sure yours does. Both the Optimal and the Adapter default choices will select a refresh rate based on the limitations of your monitor. Optimal will set the higher rate. However, in order for Windows to set an optimal rate, it too must know your monitor's limitations. If Windows can't find an .inf file for your monitor, it will automatically assign it a retina-numbing refresh rate of 60 Hz. Select the *Monitor* tab on your adapter's Properties dialog box. If your monitor isn't the one listed there, click the *Change* button and follow the prompts.

AILING MONITOR

Q My old monitor at home looks very different from my monitor at work when displaying the same picture of my pet alligator, Ralph. At work I can see all of Ralph's teeth, and his green scales look very real. But no matter how I adjust the same image on my home monitor, it's too dark to see bone fragments from his last meal, and his scales have a drab olive cast. Is my old monitor dying?

A To think I was considering a poodle as a pet. When it comes to image quality, all monitors are not created equal. Your old monitor may be going the way of most ancient reptiles, it may be inferior, or something else may be amiss. As the phosphor in your monitor's screen ages, the image the screen creates fades and blurs. To correct the problem, try adjusting your monitor's brightness and contrast. But don't confuse blurring with ghosting. If all screen images on your home PC's monitor include a faint, slightly displaced echo of themselves, you have ghosting. The cause could be a bad connection at the graphics card or monitor, so make sure everything is securely plugged in. Or the cable itself may be cheap, defective, or too long. See if installing a new one helps.

SCREEN SAVER SCHMAVER

Q Will a screen saver really prolong the life of my monitor?

A Back in the dark ages of monochrome monitors, I'd have said yes. But the phosphor in today's color monitors is much less susceptible to burn than its forebears were. As a result, screen-saver programs today function primarily as entertainment. In fact, leaving a screen saver running may shorten your monitor's life. The brightness of your screen's phosphor does fade with time, but the component likely to fail

first is the electron gun that guides the monitor's illuminating beam. The best way to prolong its life is to use your system's power management settings to shut the monitor down when it's idle. In Windows 98, you can activate and adjust these settings in the *Power schemes* tab under Control Panel's *Power Management* icon. Or just turn your monitor off when you aren't using it.

MISSING CURSORS

Q I just installed new presentation graphics software on my computer, and now when I'm in the program the cursor disappears every time I click the menu bar. What's going on?

A Odd graphics behavior is frequently caused by a conflict between an application and a corrupted or out-of-date graphics driver.

To confirm that your current graphics driver is the source of your trouble, load Windows' plain-vanilla VGA driver in its place and see whether the problem disappears. It's a circuitous process, but here's how to do it: Right-click *My Computer*, select *Properties*, click the *Device Manager* tab, select *View devices by type*, and double-click *Display adapters*. (Then breathe.) Next, double-click your display adapter, choose the *Driver* tab, select *Update Driver*, and then click *Next*. (Breathe again.) Click *Display a list*, choose *Next*, click *Show all hardware*, select *(Standard display types)* in the Manufacturers list and *Standard Display Adapter* in the Models list, and finally click *Next*. (And don't forget to breathe.)

Peripherals

BICKERING MODEMS

Q My pet parrot, Stanley, loves to imitate squeaky sounds. I am about to move his cage into my office and the last thing I need is to hear an endless chorus of "Two Modems Negotiating." Is there any way for me to silence my modem?

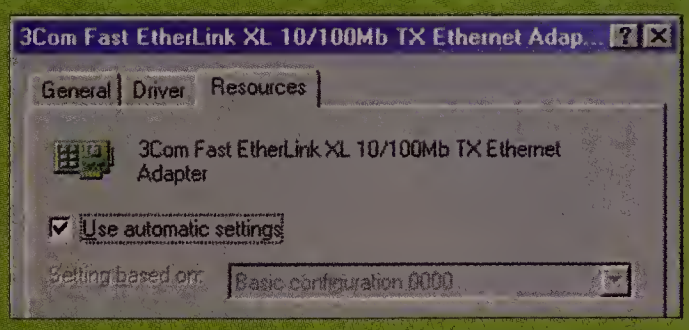
A Wouldn't it be easier to get a big cat? But seriously, in Control Panel, double-click the *Modems* icon and highlight your modem in the list. Then select *Properties*. Under the *General* tab you'll find a slider that controls the volume of your modem speaker. Even if your modem doesn't support this feature, you can still disable the speaker by going to the *Connection* tab and clicking the *Advanced* button. There you'll find the 'Extra settings' text box, which allows you to add initialization commands for your modem. To silence the modem, ▶

IRQs, DMAs, AND OTHER FOUR-LETTER WORDS

ANYONE who has installed cards and peripherals in the dark days of DOS and Windows 3.*x* knows the odd mixture of fear and revulsion evoked by the mention of an IRQ, a DMA, or an I/O address. Unraveling their mysteries was often hard and time-consuming—and didn't guarantee that your PC would work properly. Windows 9*x* has made the process easier but by no means trouble-free.

IRQs, DMAs, and I/O addresses (often called *system resources*) are assigned to individual components in your PC. They control the orderly flow of data between each component and your PC. And if any two components share the same resource—say, both your modem and your mouse are set to IRQ 3—digital chaos ensues and your system may crash.

Fortunately, Windows 9*x*, the PCI bus, and Plug and Play technology combine to do a pretty good job of assigning these resources each time your computer boots. But conflicts still happen, especially when old, non-Plug and Play cards that work only with one or two specific resources are involved.



IF YOU WANT to assign your own IRQs, you may need to go to each device's *Resources* tab in turn and deselect *Use automatic settings*.

In Windows 98, resource conflicts are listed under *Hardware Resources•Conflicts\Sharing* in the System Information utility. In Windows 95, you have to look for conflicts in the Device Manager.

In either case, if a conflict exists, you must fix it in Device Manager. Suppose you have two non-Plug and Play cards—a sound card and a network card—that are both set to IRQ 5. Let's also suppose your documentation says the network card can be reset to IRQ 7. First, you must set the network card to IRQ 7, usually by setting a jumper or DIP switch on the card. Then you must reserve both IRQ 5 and IRQ 7 so Windows won't assign them to other devices. Do this by double-clicking the Device Manager's *Computer* icon and selecting the *Reserve Resources* tab. If Windows recognizes both cards and their settings, you're done. If not, you'll have to double-click each card's entry in Device Manager, go to the *Resources* tab, and force each card to accept the IRQ of your choice by deselecting *Use automatic settings*.

enter **ATM0**. And if all else fails, introduce Stanley to Ralph the alligator (see the "Ailing Monitor" tip, page 136).

DROPPED CONNECTIONS

Q I hate it when my modem suddenly drops the connection to my ISP. It happens as often as twice an hour. Is the villain my software, my hardware, or my ISP?

A I hear you. Random disconnects occur when your modem or serial port hardware can't handle the flow of incoming or outgoing data due to line conditions, degraded hardware, or both. Here are a couple of ways to slow the data flow and possibly correct the problem.

First, in Control Panel, open the *Modems* applet and click *Properties*. At the bottom of the *General* tab, you can alter the maximum speed setting for your modem. Select the next-highest speed and reconnect to your ISP. This will, of course, limit your modem to the speed selected, but it may keep you connected.

Second, try the same strategy by going to the *Connection* tab of your modem's *Properties* screen and clicking the *Port settings* button. Two bars control the data flow through your serial port. Slide the bars back one notch at a time, and try reconnecting after each adjustment.

MODEM CAN'T SPEAK DOS

Q I just set up my brand-new Celeron-433 system, and I can't get my modem to work with any of my old DOS communications software. Any ideas?

A Finally, a question to which my only response can be "Sorry, Charlie." Many budget systems come with host-based modems (aka Winmodems) that won't work in DOS. These modems lack much of the hardware found on standard modems. Instead of using chips, they rely on software stored on the hard disk to guide their operation—and that software runs exclusively on Windows. If you love your DOS programs, buy a new modem. Internal ones cost $40 to $80 (see *Top 10 Modems*, page 263).

MODEM X

Q My new modem seems to work fine when connecting to the Web, but several features, like Caller ID, don't work properly. Did I screw up the installation?

A Quite possibly (no offense). Many problems can result from installing the wrong driver for your modem. When you initially install a modem, Windows looks for configuration information for that specific modem. If it can't find it, Windows treats your modem as a generic one that's capable of handling basic operations but not necessarily certain features specific to your make and model.

If you installed your modem using the bundled software, you should be okay. But check your modem vendor's Web site to see if a new driver is available.

To identify the driver version you're currently using, double-click the entry for your modem in Device Manager and select the *Driver* tab. The *Update Driver* button launches a wizard that walks you through installing a new driver from the Windows driver database on the Windows CD-ROM—or from a floppy, the modem maker's CD-ROM, or a hard disk.

PRINTER SOUP

Q Word documents and graphics both come out of my laser printer looking like victims of a meltdown at the alphabet soup factory. Can you help?

A Your printer may have a problem that requires repair, but you should try several cheaper alternatives first. ▶

CHECKLIST

Printer Problems 101

OH, THE SHEER agony of sending that important file to your printer only to see 'Error writing to LPT1' flash on your screen. It's possible your printer is damaged and needs repair; but before you take it in for service, try this:

1 **Check your power and paper supply.** Make sure the printer is online and has paper in its tray. Clear the printer's memory by turning the printer off, waiting a few seconds, and then turning it back on.

2 **Check your cable.** Make sure your printer cable is firmly connected to both the printer and the PC. If your current cable is old, poorly constructed, or too long, signals may not reach their destination in coherent condition. Try replacing the cable—and don't hesitate to spend the extra $10 to get a high-quality IEEE 1284-compliant (not IEEE 1284-*compatible*) cable.

3 **Now check your ports.** Go to Device Manager by right-clicking *My Computer* and selecting *Properties*. Go down to 'PORTS (COM and LPT)' and double-click on the *LPT1* setting. Confirm the 'Device status' box is free of IRQ or DMA conflicts.

4 **Mediate.** If you've got a DMA conflict with your parallel port, check to see if it's configured as an ECP port. ECP is used in most new printers; it speeds up printing by using your PC's RAM. If your printer uses ECP and you have a DMA conflict, assign your parallel port an unused DMA via the CMOS setup program or Device Manager. If your printer doesn't support ECP, you need to configure the parallel port to a slower, compatible setting in the CMOS setup. Most PCs offer four settings. Standard is the slowest, but it comes closest to being universally compatible.

5 **Get a new driver.** Drivers become corrupted or outdated. Go to the Printers folder (select *Start•Settings•Printers*), and delete your printer's icon. Then check your printer vendor's Web site for an updated driver; if you find one, download and install it. If not, reinstall your current printer driver via the *Add Printer* icon.

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Start by reviewing the "Printer Problems 101" checklist on the previous page. If that doesn't help—and your printer supports Postscript—try loading a Postscript driver. If printing returns to normal, you may have a corrupted universal printer driver file, unidrv.dll. Reload a fresh copy from your Windows 98 CD-ROM.

You can also try bypassing Windows' spooling function, which converts your print job to an intermediate data format called EMF, stores it, and then prints it. Sending your print job straight to the printer skips this process and avoids any conflict your printer may have with the Windows spooling function. To turn spooling on and off, open the *Details* tab of your printer's *Properties* menu and click the *Spool Settings* button.

Finally, try printing from DOS. A simple way to do this is to select *Restart in DOS mode* from Windows' Shutdown menu and wait for a DOS prompt. At the prompt, type **dir>LPT1** and press **<Enter>**. This simple-looking instruction generates a directory list of file names and then sends it to your printer. If the list prints properly, your printing problem is more likely software-related than hardware-related. On the other hand, if this experiment produces yet another splatter of printed chaos, remember my golden rule and call technical support.

SPOTTY GRAPHICS

Q When I print my text documents on my laser printer, they come out fine. But when I try to print a picture or other graphic, only part of the image prints. Why?

A Your printer probably doesn't have enough memory to print the whole image. If you print graphics, the best solution is to install extra memory.

If your printer already has 1MB or more of memory installed, the printer driver may not be using that memory. Open your printer's *Properties* menu by right-clicking the icon for your printer in the Printer folder. Then select the *Device options* (or similarly named) tab. If you find a memory setting listed there, make sure that it's set correctly.

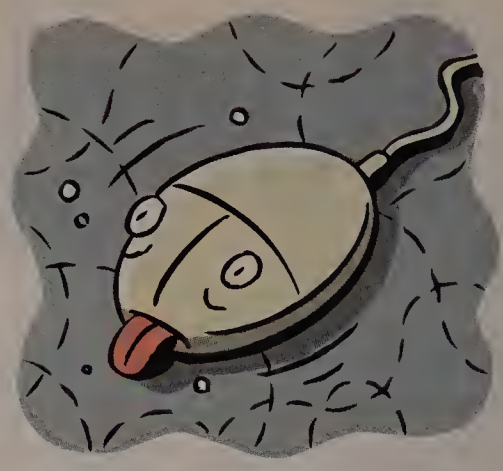
You can also go to the *Details* tab, click the *Spool Settings* button, and change the 'Spool data format' setting from *EMF* to *RAW*. This may boost the effectiveness of your printer's RAM.

As a last resort, you can lower the print resolution setting under the *Graphics* tab. This will lower the quality of your graphics, but if that isn't crucial to what you're doing, it will help conserve your printer's memory.

ERRATIC MOUSE

Q I changed my screen resolution from 640 by 480 to 800 by 600, and now my mouse pointer behaves erratically. Can I fix this?

A Strange mouse behavior often signals a conflict between the mouse driver and the display driver. To investigate this possibility, right-



click *My Computer*, click *Properties*, and select the *Performance* tab. Then click the *Graphics* button and slide the *Hardware acceleration* pointer one notch to the left. If your mouse suddenly works fine, it means you have a driver conflict.

USB ISSUES

Q I have a Windows 95, Pentium-233 system with built-in Universal Serial Bus ports, but I can't seem to get my USB mouse to work. Isn't USB supposed to be Plug and Play?

A Well, yes, it is. But having a USB port doesn't guarantee it will work. Some of the first PCs to sport USB jumped the gun and included USB ports before the final USB specifications were nailed down. To establish a USB connection, you need the right hardware, the right Windows (Win 95 OSR2 or Win 98), and the right BIOS. To see whether your PC really is USB-ready, run usbready.exe, a free utility that examines your system and identifies what's needed. Download it from the USB Web site (www.usb.org/usbready.exe) or from PC World Online's FileWorld.

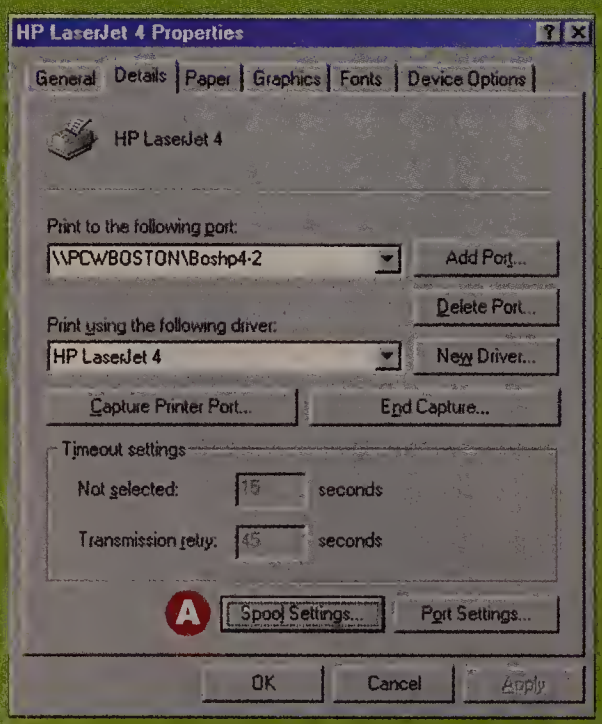
If you have a nonfunctioning port, you can add USB ports with a PCI expansion card such as Belkin's $50 USB BusPort.

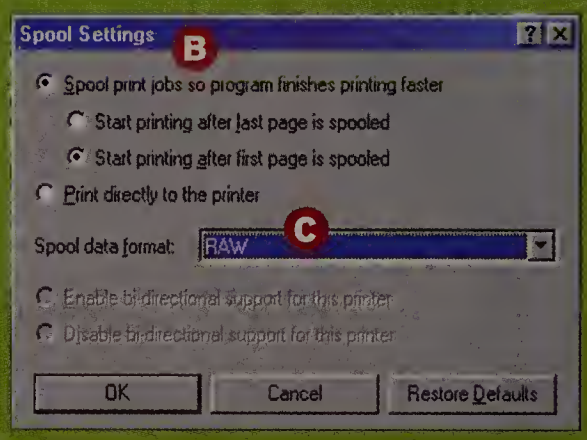
- **USB BusPort** $50 list; Belkin; 800/223-5546; www.belkin.com

PRODUCT INFO NO. 665

You'll find files mentioned in this article at www.fileworld.com/magazine. Kirk Steers is a contributing editor of PC World *and is author of the monthly* Hardware Tips *section.* ■

PRINTER WOES? From your printer's *Details* tab, click on the *Spool Settings* button (A). Then you can try either turning the spooling feature on or off (B) or changing the spool data format to make better use of your printer RAM (C).





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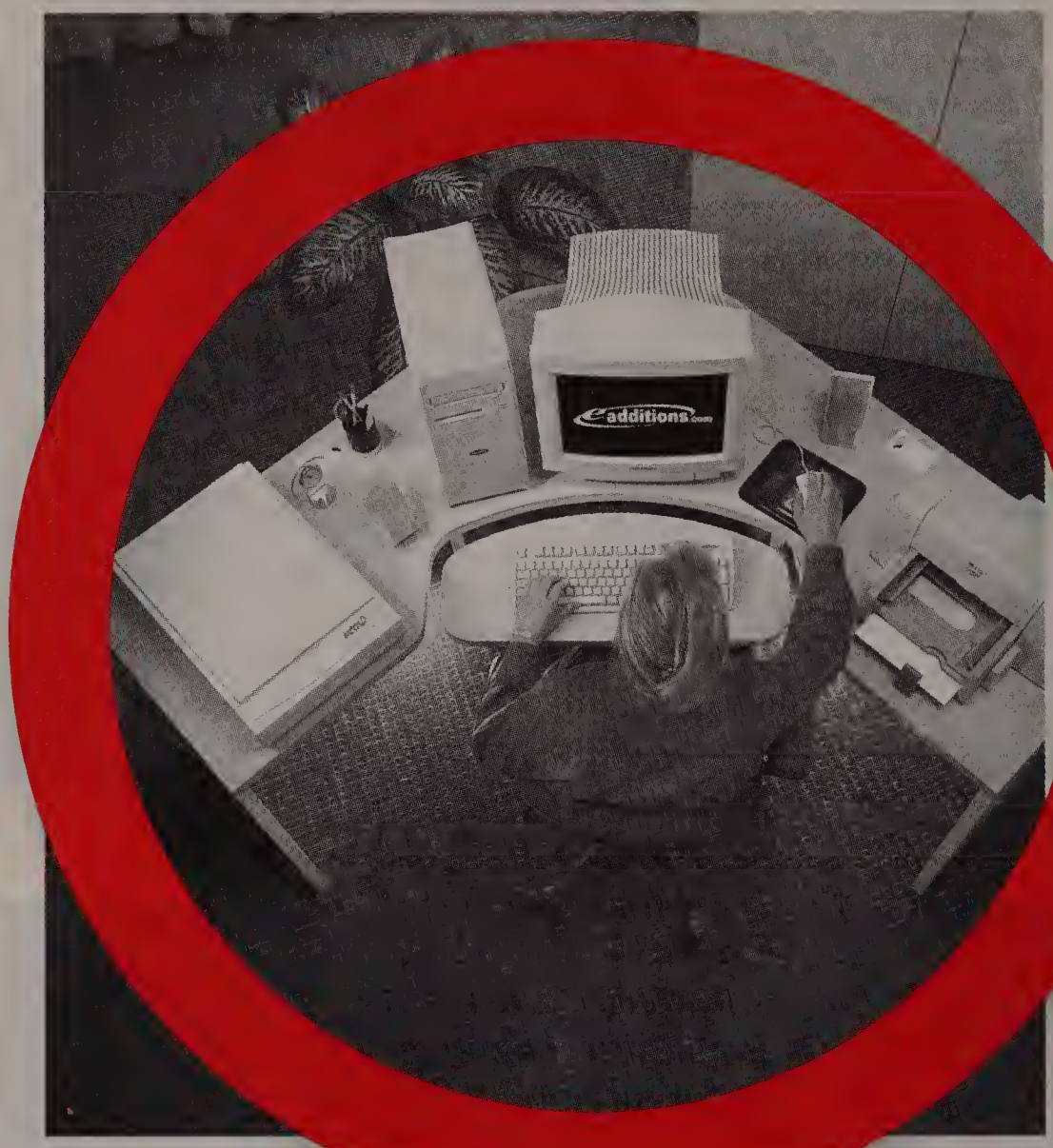

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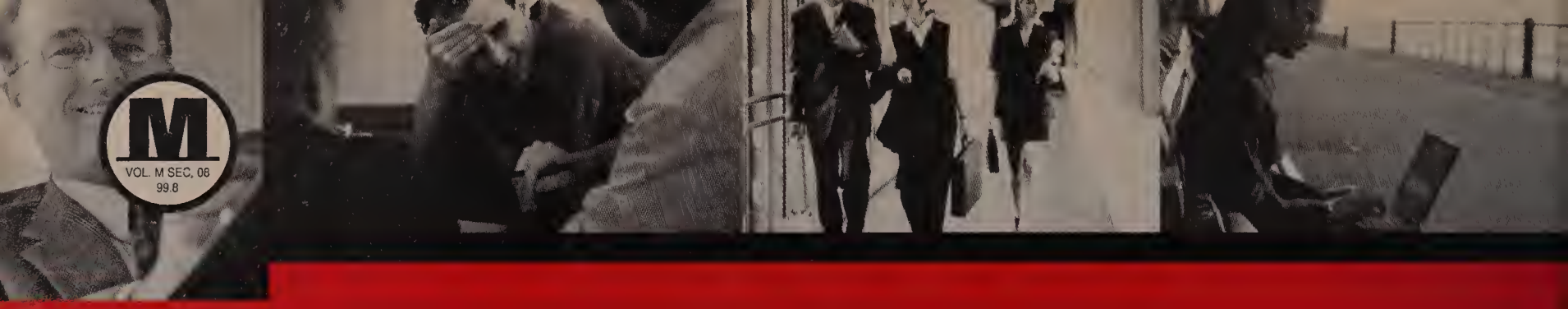

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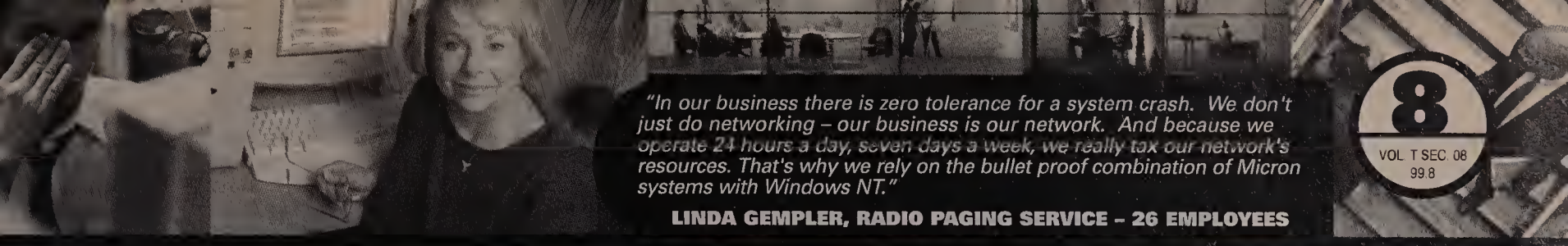
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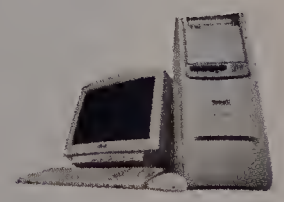

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Hard Drive	4.3GB hard drive◊	8.4GB Ultra ATA hard drive◊	8.4GB Ultra ATA hard drive◊
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Graphics	8MB nVidia AGP graphics	8MB nVidia AGP graphics	16MB nVidia AGP graphics
Sound System	Wavetable sound and stereo speakers	Wavetable sound and stereo speakers	Wavetable sound and stereo speakers
Network	3Com 3C905 network card	3Com 3C905 network card	3Com 3C905 network card
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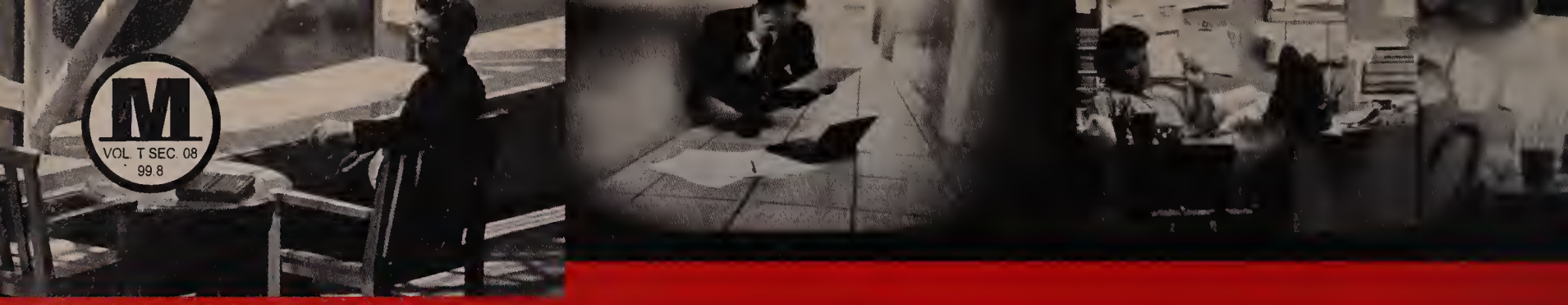

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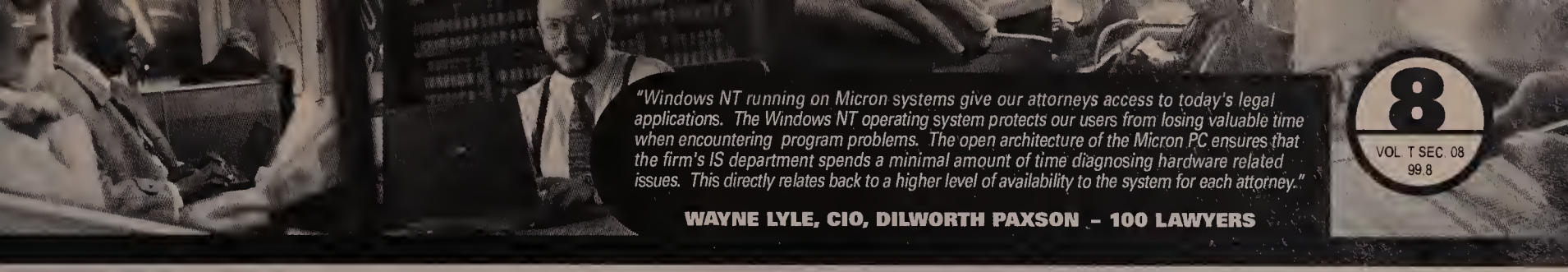

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Hard Drive	4.3GB hard drive* (removeable)	6.4GB hard drive* (removeable)	14GB hard drive* (removeable hard drive. 28GB option with 2 drives.)
Monitor	12.1" SVGA TFT display	15" XGA TFT display	15" XGA TFT display
Graphics	8MB AGP graphics accelerator	8MB AGP graphics accelerator	8MB AGP graphics accelerator
CD-ROM	24X var. speed CD-ROM drive°	24X var. speed CD-ROM drive°	24X var. speed CD-ROM drive°
Extra Storage	3.5" floppy disk drive (dedicated bay)	3.5" floppy disk drive (dedicated bay)	SuperDisk LS 120
Software	Microsoft Windows® 98	Microsoft Windows NT Workstation 4.0	Microsoft Windows NT Workstation 4.0
Micron U	1-year free$^{\Delta}$ training @ Micron U online	1-year free$^{\Delta}$ training @ Micron U online	1-year free$^{\Delta}$ training @ Micron U online
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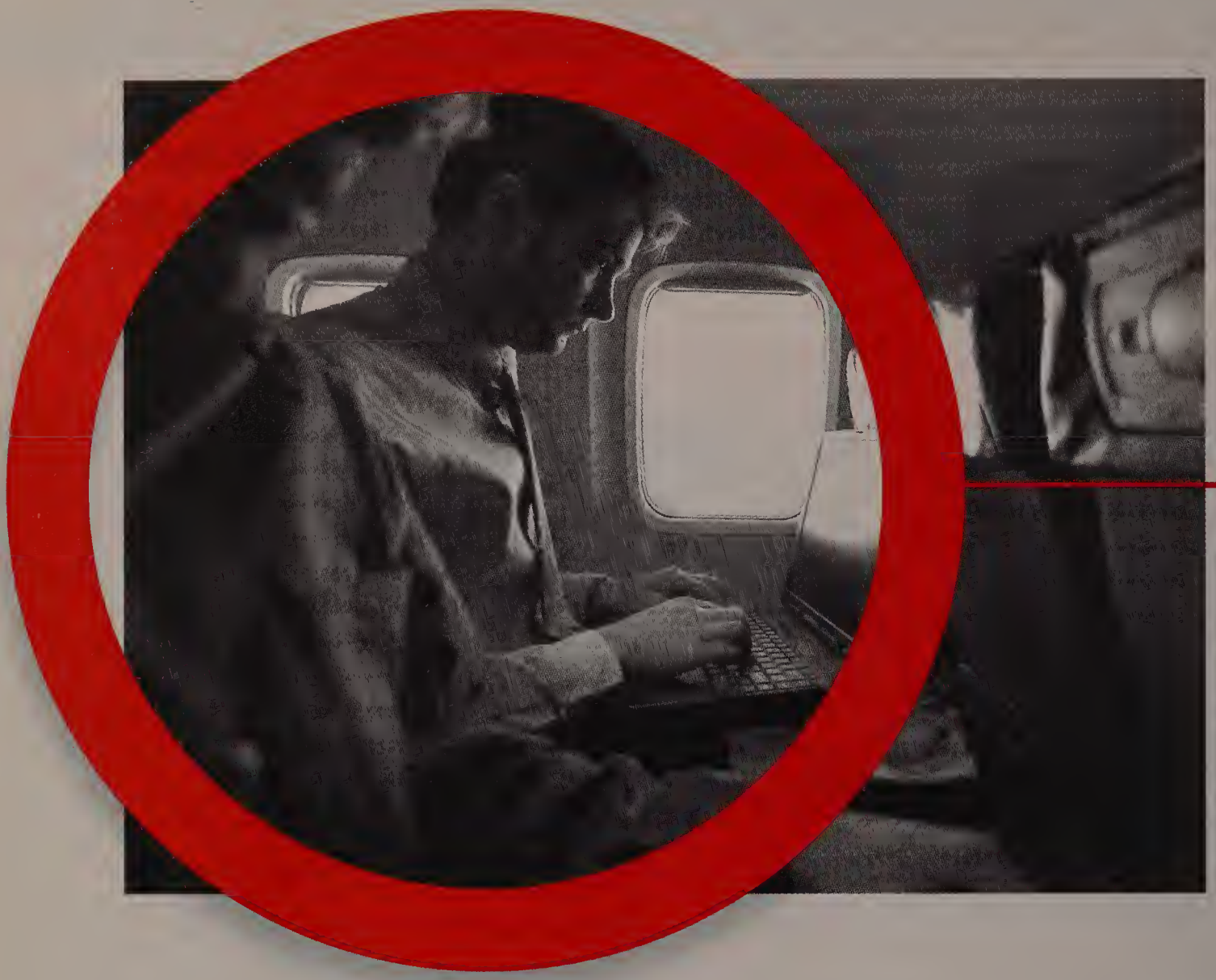

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THE FIX IS IN Top Windows Utilities

PHOTOGRAPHS: PETE McARTHUR; ILLUSTRATIONS: MARK MATCHO

Want to cure common Windows ailments? You need the right tools. From uninstallers to crash prevention utilities, we rate the best and the rest.

MAYBE YOU'VE never experienced a real PC disaster, a full-fledged data-spewing-from-every-port meltdown. Maybe you've never needed the kind of tips found in "Trouble-shooting Is My Business" (page 124). Lucky you. But trust us, someday your PC will turn on you. Unless, that is, you arm yourself first. The right Windows utilities can save you from a world of hurt.

The question is, how much help do you need? We enlisted six utilities experts to compare Windows 95/98's built-in tools with 35 third-party utilities. For each utility category, we asked our reviewers to address one question: When does it make sense to pay extra money for a third-party utility, given that you can obtain much

INSIDE

155 SUITES | 158 DIAGNOSTICS | 160 UNINSTALLERS | 162 FILE COMPRESSSION

of the same functionality from Windows itself?

Microsoft released Windows 98 more than a year ago, with plenty of noise about the operating system's new tools—like Disk Cleanup and System Information. But these and other enhancements don't guarantee you'll be able to handle every problem that comes with Windows. Many users will discover they need third-party utilities to keep their PCs in tune.

The utilities we examined fall into eight categories: suites, diagnostics, uninstallers, file compressors, crash monitors and recovery tools, file managers, file viewers, and undoers and undeleters.

Wondering where the antivirus and Y2K utilities are? For the latter, you'll have to wait until next month for our Y2K roundup. For the former, turn to "Virucide!" in our February issue (www.pcworld.com/feb99/antivirus). Symantec's Norton AntiVirus has now won our World Class award for best antivirus program three years in a row. And because the overwhelm-

EDITED BY CAMERON HEFFERNAN AND DAN MILLER

164 CRASH PREVENTION | 166 FILE MANAGERS | 168 FILE VIEWERS | 170 UNDO/UNDELETE →

ing majority of our readers currently use Windows 95/98, we didn't look at any Windows NT–specific products, though some of the ones we reviewed will work for all three Microsoft operating systems.

ADD IT UP

WHEN IT COMES to choosing utilities, you really have four options: Stick with what comes with Windows, assemble a collection of stand-alone utilities, buy a utility suite, or cobble together some combination of all three. To determine which option makes the most sense for you, take our utilities quiz (below).

Windows itself offers diagnostic tools (such as System Information, Registry Checker, and ScanDisk), an uninstaller (the Add/Remove Programs applet in Control Panel), file managers (Explorer and, for Win 3.*x* diehards, File Manager), a file viewer (Quick View), and a stopgap utility for recovering deleted files (the Recycle Bin). It doesn't have tools for compressing individual files or for anticipating and recovering from crashes, though the Close Program dialog box (<Ctrl>-<Alt>-<Delete>) often helps you recover from an application crash by enabling you to close the crashed app.

For some users, putting together a customized collection of tools makes sense. Maybe they need an uninstaller or a file compression tool to supplement Windows' own utilities. Taking the onesie-twosie route can be cheaper than you think—most of these products cost $50 or less. Many stand-alone products are offered as trial-version downloads, so you can kick the tires and see what you like.

For most users, however, suites offer the sweetest deal. Depending on the suite, you get tools for viewing, managing, compressing, and undeleting files; diagnosing hardware and software problems; uninstalling applications; and intercepting or recovering from crashes.

Take, as an example, a typical business user who downloads lots of shareware applications from the Internet, sends scads of e-mail attachments, and all the while wants a smoothly running PC. If she buys Norton SystemWorks for $60, she gets an uninstaller (to remove all the shareware apps she doesn't like), virus protection, a diagnostic tool to check her hardware and optimize her Windows Registry, a compression tool (to shrink e-mail attachments), and a crash-prevention utility. If she frequently receives files created in applications she doesn't have, she may want to add a dedicated file viewer—or opt for Mijenix's Fix-It Utilities 99, which includes excellent tools for managing and viewing files, but lacks an uninstaller. If you need three utilities that cost $30 each, and you can get the same functionality from a suite that costs $50, why not buy the suite?

Prices for utilities vary widely. Some of the difference depends on whether you buy online direct from the vendor or hunt it down at your local superstore. But the price you pay also depends on how the product is packaged—as a bare-bones download (with nothing on CD or paper), shrink-wrapped on CD-ROM with a manual, or as a colorfully packaged and boxed product with documentation. For this reason, we include a range of street prices for individual products where applicable.

WHERE SHOULD YOU LOOK?

ANOTHER COMPLICATING factor: Some of these products don't fit neatly into a given category. Mijenix's PowerDesk, for example, can manage, view, and compress files, but we chose to review it in the file management section. If the utilities quiz indicates that you need a stand-alone utility (rather than a suite or nothing at all), don't ignore the other sections of the review; you may find a product that meets your primary needs as well as several ancillary ones.

An Exercise in ☑ Utilities

YOU MAY NOT NEED to plunk down cash for a third-party Windows utility. After all, Windows packs its own set of tools, from the Recycle Bin to Add/Remove Programs. So should you spend the extra money on a stand-alone package? To find out, take the quiz below.

DO YOU...	THEN YOU NEED A THIRD-PARTY...
☐ still use Windows 95 as the operating system for your desktop computer, or are you responsible for keeping multiple systems up and running?	diagnostics program, page 158
☐ frequently download files from the Internet, experiment with new applications, or want to get rid of old apps that Windows' Add/Remove Programs can't handle?	uninstaller, page 160
☐ need to conserve hard disk space, share large files, uncompress Web files, or back up files?	file compression program, page 162
☐ work on a PC that has a history of crashing, or use your PC to run apps your business absolutely depends on?	crash monitor, page 164
☐ work with files a lot—downloading them, examining them, relocating them, and zipping them into archives—or do you frequently transfer FTP files to and from a Web site?	file manager, page 166
☐ receive numerous files from a multitude of sources in many different formats?	file viewer, page 168
☐ need to keep multiple old versions of files you worked on, or are you willing to invest $70 to protect your data?	undo/undelete program, page 170
☐ Did you answer *yes* to two or more of the questions above?	Then you need a suite, page 155.

The Suites **Jacks of All Trades**

Both Symantec and Mijenix have developed great products, but we give Norton SystemWorks the nod.

BY STAN MIASTKOWSKI

WHEN IT COMES to utilities, the current crop of suites is bountiful. Buying one of them often makes more sense than purchasing several separate products because they're cheaper and in most cases more convenient, presenting you with just one product to install, one interface to learn, and one manual to read. But suites can also be overwhelmingly vast, resource-hungry, and confusing.

Based on market share, Network Associates' McAfee Office and Symantec's Norton SystemWorks are the 500-pound gorillas of utility suites. Unfortunately, we could only review one of the two. According to McAfee's current schedule, it will have shipped an updated version of Office—dubbed Office 2000, and arrayed with a different group of bundled utilities—by the time you read this. McAfee Office 2000 should offer improved integration over its predecessor, which took a mixed-nuts approach (see "McAfee Cleans Up Its Office," page 157). Norton SystemWorks doesn't win the crown in this area by default, however: We compared it with an impressive newcomer, Fix-It Utilities 99 from Mijenix.

Not much is missing from Symantec's $70 suite. SystemWorks combines Norton Utilities, Norton AntiVirus, Norton CleanSweep, Norton CrashGuard 4, and Norton Web Services. You also get a "bonus pack" CD-ROM that contains some useful extras, including Zip-It, Norton 2000 BIOS Test & Fix, Visual Page (a basic Web page designer), and WinFax Basic Edition. SystemWorks Pro, a $100 package designed for small businesses, adds Norton Ghost (a ▶

BEST BUYS

SUITES

Both Symantec's **Norton SystemWorks** and Mijenix's Fix-It Utilities 99 are great all-purpose tools. Norton gets the nod for including an uninstaller. But if a top-notch file manager is more important to you, go for Fix-It Utilities 99, with its copy of PowerDesk Utilities 98.

DIAGNOSTICS

No Best Buy. If you have Windows 98, stick with it. If you use Windows 95, either upgrade to the newer OS or get Norton SystemWorks and use its copy of Norton Utilities.

UNINSTALLERS

An easy interface and thorough deletion of old program files (even apps not designed to be uninstalled) help **Norton CleanSweep 4.5** win—but get it as part of Norton SystemWorks.

FILE COMPRESSION

Our two favorites are **WinZip 7** (not shown) and **PKZip for Windows v.2.6.** Both let you compress and decompress files for backup, archiving, moving, e-mailing, or packing onto floppies—all with minimal effort.

CRASH PREVENTION

No Best Buy. To prevent crashes, opt for Norton CrashGuard as part of the Norton SystemWorks suite. CrashGuard successfully intercepts application crashes before they bring the rest of your system down, and it lets you pick from among several options to relaunch and save data from failing apps.

FILE MANAGER

If Windows Explorer is driving you crazy, obtain a copy of Mijenix's **PowerDesk Utilities 98** (included with Fix-It Utilities 99). It's easy to use and integrates nicely with Windows—and it's the cheapest file manager we looked at.

FILE VIEWER

People who need greater file-viewing flexibility than Windows' Quick View utility provides should opt for one of our co-Best Buys: Jasc's **Quick View Plus** or Verity's **KeyView Pro 6.5.** Both let you view and work with files created by apps you don't have on your PC.

UNDO/UNDELETE

A $40 indulgence, **Undo & Recover Toolbox 2** automatically tracks all the files on your PC, including the Registry, and gives you plenty of ways to recover old files. For even bigger spenders, **GoBack** ($70) is an incredible PC time machine for reverting to a previous system configuration so you can recover from viruses and crashes.

utility that backs up and clones entire hard drives) and Norton 2000 (a tool that scans hardware, applications, and data for potential Y2K problems).

Less comprehensive than SystemWorks, but also $20 cheaper, Fix-It Utilities 99 includes tools for monitoring, analyzing, and optimizing your system, and tools for fixing software problems (especially those related to the Registry). It also supplies an antivirus utility, a crash monitor, and—best of all—PowerDesk, Mijenix's excellent file manager (see "File Managers," page 166). Missing from Fix-It are an uninstaller and a feature like Norton Web Services to update Windows, apps, and hardware drivers.

It's easy to see why suites are good deals. If you bought the individual packages that make up Norton SystemWorks separately, you'd pay more than $170. Similarly, Mijenix sells its excellent PowerDesk Utilities 98 program separately for $30, more than half the cost of the entire Fix-It Utilities 99 package.

Suite Specifics

WE LIKE BEST BUY Norton SystemWorks for its comprehensive set of tools.

FEATURE	Mijenix Fix-It Utilities 99 [1]	Symantec Norton SystemWorks	McAfee Office 2000 [2]
Analysis/optimization	●	●	●
Antivirus	● [3]	● [3]	● [3]
Crash protection	●	●	●
Driver/software update [4]	○	● [3]	● [3]
Emergency boot disk	●	●	●
File compression/decompression	●	●	●
File management	●	○	○
File viewing	●	○	○
Undo/undelete	●	●	●
Uninstall	○	●	●
Y2K diagnosis	●	●	●

● Yes ○ No

[1] Including PowerDesk Utilities.

[2] Data from company spokesperson; product not available for review.

[3] Extra-cost subscription required after free trial.

[4] Updates software and drivers for installed operating system, hardware, and applications.

INSTALLATION—BETTER THAN EVER

IN THE EARLY DAYS of utility suites (meaning a year or so ago), installation was a pain. Too often, it meant going through a separate installation routine for each component. Today, however, installing either SystemWorks or Fix-It Utilities 99 is a breeze in comparison.

In SystemWorks, a simple screen allows you to choose which components to install—and that's a good thing because the works occupy 122MB of hard disk space in their entirety. It's even simpler with Fix-It Utilities 99 (PowerDesk Utilities 98 is a separate install on the same CD-ROM): Everything gets installed at once and the whole suite takes up only 18MB of space.

Both packages also come with emergency disks that let you boot your system even when your hard drive is fried. During installation, you create the necessary rescue floppies, customized with the specific hardware drivers your PC needs. And in a refreshing change from the recent tendency of software developers to provide their manuals only on disc, these two suites come with thick (200-plus-page) printed manuals, which may come in handy when your drive is momentarily muddled. Both offer extensive integrated help, too.

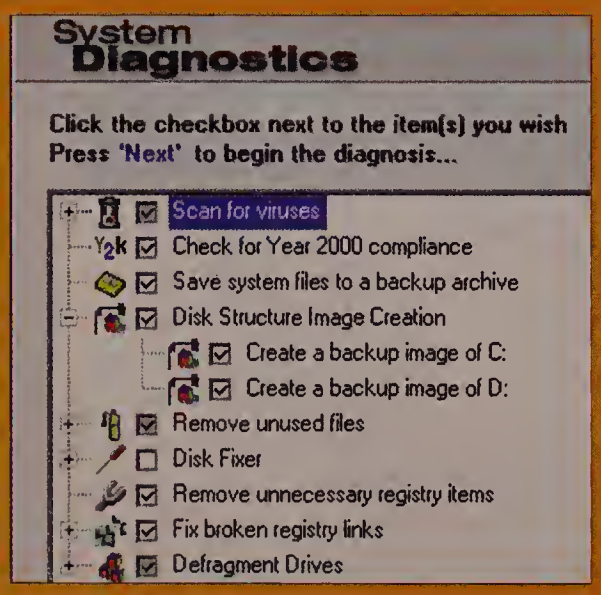
After installation, SystemWorks and Fix-It each volunteer to check their Web sites for recent updates—slight version upgrades, bug fixes, or (in the case of SystemWorks) a new version of one of the suite components. A word to the wise: Like other applications, these suites carry READ.ME files containing potentially essential information—such as known hardware and software incompatibilities—that you should read before, not after, you install the software.

Unfortunately, the READ.ME file was not much help with Fix-It 99: After we installed the suite on our test PC, our system began locking up and crashing. Mijenix's technical support reps eventually tracked the trouble to a (previously unknown) incompatibility between Fix-It and an old driver for a Hewlett-Packard CD-RW drive residing in our PC.

WHAT'S WRONG WITH THIS PC?

DIAGNOSTICS lies at the core of each suite. Both SystemWorks and Fix-It Utilities 99 let you continuously monitor crucial system parameters, such as memory use, free disk space, and percentage of CPU power being used at a given moment. You can automate the process of checking your system with a scheduler that lets you specify what you want checked. You can also set system resource thresholds and arrange to have

DIAGNOSIS PLEASE: Fix-It Utilities 99's Fix-Wizard (below) runs multiple diagnostics with a single click. You can access all the main features from one centralized location (below right).



the products alert you when a resource falls below that level.

Once installed, each suite offers a centralized interface, though Fix-It Utilities 99 is the better integrated. Symantec has done a good job of tying together the various tools in Norton SystemWorks, but substantial differences remain in the look and feel of each package.

At hard-core diagnostics—especially hardware—Fix-It Utilities 99 edges Norton. Fix-It's PC Diagnostics can perform a wide range of analyses that delve deep into specific hardware, from the motherboard to RAM to hard drives. This can be valuable for spotting problems before they become major. SystemWorks lacks comparable abilities.

Both suites have crash-protection programs, and though they can't recover from some situations—such as esoteric hardware problems or Windows glitches—these crash-protection modules are valuable additions. Norton CrashGuard and Mijenix CrashProof 99 offer wide protection in their default settings, and numerous customizable settings (mainly for advanced users).

On our test PC (a Pentium II-333 with 128MB of RAM), we didn't notice any performance slowdown when either suite was in place. Your mileage may vary, of course, especially if you have an older, slower PC with limited RAM.

INFECTION WATCH

AS VIRUSES proliferate and become more dangerous, an effective antivirus package is essential. Both utility suites offer similar antivirus features, including full-time background virus scanning, one-touch active scans, and easy updates of essential virus signature files via the Web. Both products let you schedule your virus-file updating, and both scan downloads for viruses.

Symantec provides a year of free virus signature updates with Norton SystemWorks. After that, the company charges $3 per year for updates. We haven't had a chance to test Fix-It's virus eradication skills yet. Like Symantec, Mijenix offers free virus signature updates for one year.

McAfee Cleans Up Its Office

AS WE WORKED on this story, McAfee informed us it was pulling the plug on the current version of Office. The replacement—McAfee Office 2000—wasn't available for an early look, but the company did fill us in on where the suite is heading.

According to Tracy Hulver, Network Associates' product manager for McAfee Office, McAfee Office 2000 should be available by the time you read this, bearing a street price of $59 (same as before). The new version will eliminate several utilities from the current Office suite, including Pretty Good Privacy, Hurricane (Windows optimization), and Guard Dog (Internet security). Hulver says that many elements of these three utilities overlapped with features present in other components.

That leaves six utilities in McAfee Office 2000: First Aid 2000 (emergency repair); Nuts & Bolts (analysis, optimization, data security, and crash protection); Oil Change (software and driver updates via the Web); UnInstaller (removing or moving applications); ViruScan (virus detection and repair); and 2000 ToolBox (Y2K testing).

The biggest change in McAfee Office 2000, Hulver says, is a completely new (and as yet unnamed) browser-based replacement for McAfee Office Central—the main interface through which users access the other components of the suite. This will permit much greater integration between the different components.

Most individual utilities will remain fundamentally unchanged in Office 2000. The exception is 2000 ToolBox, which will be updated to handle Microsoft Office 2000 and Windows 2000.

Both suites reward purchasers with some nice extras. Norton Web Services merits special mention. Like Oil Change and similar online update services, it analyzes your Windows installation, applications, and hardware drivers, and then checks your system's contents against its online database. A Symantec spokesperson says the database includes the top 500 applications, as well as 250 games, the top 10 browser plug-ins, 25 shareware applications, and hundreds of hardware drivers. New components are added and updated every month. You choose the updates you want; the software then downloads them for you to install. Norton Web Services even tells you whether or not a given patch can be uninstalled (one ActiveX update we were offered, for example, wasn't uninstallable). Norton Web Services comes with a six-month free subscription; after that, subscribing costs $30 a year or $4 a month.

Fix-It, on the other hand, comes with PowerDesk—which all by itself may give Mijenix's suite the edge over SystemWorks for some users. It includes several features that the Symantec product does not: powerful file viewing and file management, file shredding, a graphics conversion utility for 19 graphic formats, and e-mail attachment decoding. And unlike SystemWorks, Fix-It runs on Windows NT as well as on Win 95/98.

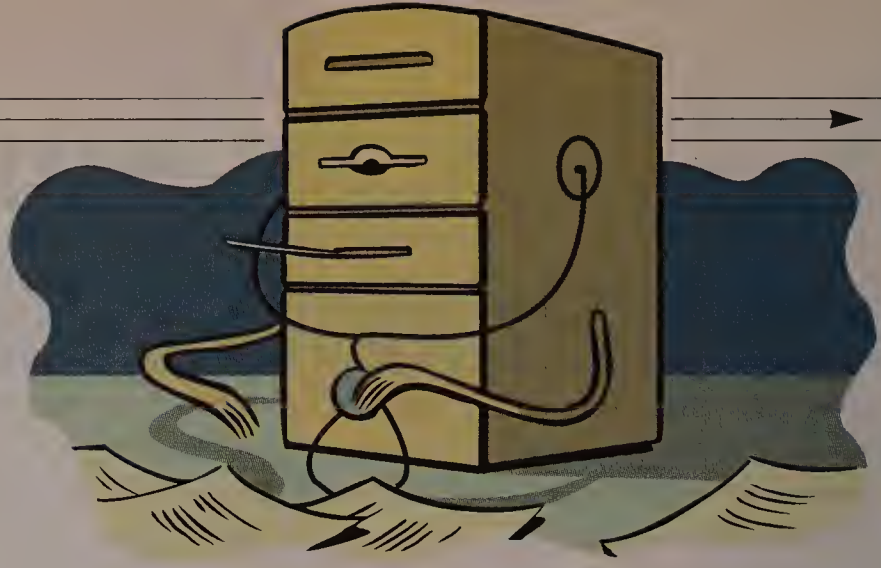
Norton SystemWorks street pricing: $55-$70; Symantec; 800/441-7234; www.symantec.com

PRODUCT INFO NO. 627

• **Fix-It Utilities 99** street pricing: $40-$50; Mijenix; 800/645-3649; www.mijenix.com

PRODUCT INFO NO. 628

Diagnostics Heal Thyself



For finding and fixing common hardware and software problems, Windows 98 provides enough muscle for most users. But if you manage multiple systems or you still use Windows 95, get the copy of Norton Utilities 4 that comes with Norton SystemWorks. **BY ROBERT LAURISTON**

WIN 98'S BUILT-IN System Information utility can probably tell you anything you want to know about your PC's hardware or software. None of the four third-party diagnostic utilities we tested—CheckIt 98, First Aid Deluxe 2000, Nuts & Bolts 98, and Norton Utilities 4—beat Windows at listing which hardware component uses which IRQ, or at identifying the contents of system memory.

Windows 98 is also tops at diagnosing and solving hardware problems, like malfunctioning modems and flaky video cards. After intentionally creating a series of hardware conflicts by fiddling with interrupts in Device Manager, we found that Windows 98 resolved as many mix-ups as the third-party products.

Furthermore, the third-party products made a number of boneheaded mistakes in attempting to identify basic problems. For example, when we disconnected our printer's parallel cable and asked CheckIt to troubleshoot the problem, the utility claimed to have tested the printer. It then suggested that we run Windows 98's Disk Cleanup, Defrag, and ScanDisk—all completely irrelevant steps. After running First Aid's checkup routine, we were told that our system's lack of sound card drivers was a "critical" problem; the program should have recognized that we had no sound card installed (a fact that CheckIt, Nuts & Bolts, and Windows 98 all figured out). For its part, Nuts & Bolts reported that our modem was "working optimally," even after we had disconnected it.

One third-party tool—Norton Utilities' Disk Doctor—does a better job than Windows of keeping your hard drive in good working order. It can fix many errors—such as problems with a disk's boot record or partition table—that Windows' ScanDisk can't. Norton Speed Disk is more flexible than Windows' Disk Defragmenter. For example, it can move recently opened files to the most accessible area of the hard drive.

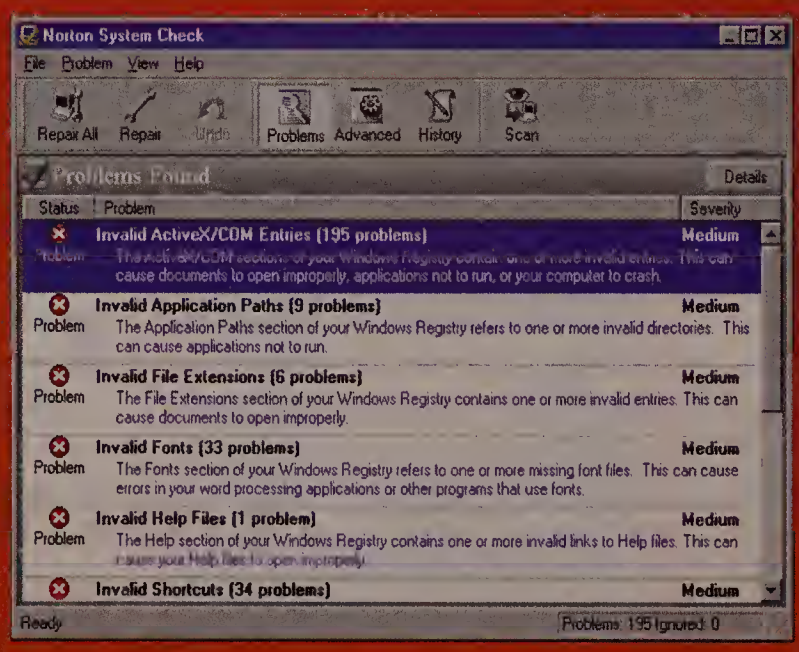
SOFTWARE WOES

WINDOWS 98 proves inadequate—and First Aid, Norton Utilities, and Nuts & Bolts more effective—when it comes to diagnosing Registry errors, shortcuts to missing or moved files, junk left behind by deleted programs, missing DLLs, broken file associations, and other software-related problems. (CheckIt claims to have software-troubleshooting tools, too, but in reality it relies almost entirely on those that come with Windows 98.)

Both First Aid and Norton Utilities automatically scan your system for existing and potential Windows problems. After the scan, each lets you decide which problems to fix and which to leave unchanged. If you opt to have the program fix everything, it will try to do the job; afterward, you'll receive a new list of items that couldn't be fixed, with tips for fixing them yourself. On one test system, both First Aid and Norton found more than 100 such problems in the Registry alone; Windows 98's Registry Checker found none. Nuts & Bolts found more than 100 problems as well, but its Auto-Fix routine resolved only a handful.

If you run Windows 98 and your system's not problem-prone, you probably don't need a stand-alone diagnostic utility. If you run Windows 95, these diagnostic tools are one very good reason to upgrade to Windows 98. If you'd rather stick with the older OS, Norton Utilities 4 is your best bet for a finder/fixer tool—but you should get it as part of Norton SystemWorks.

NORTON UTILITIES' SYSTEM CHECK will check your system for you and then list the problems it finds. At that point, you can have the program make the fixes, or take care of them yourself.



- **CheckIt 98** street pricing: $42-$50; Touchstone; 800/800-2467; www.checkit.com

PRODUCT INFO NO. 629

- **First Aid Deluxe 2000** street pricing: $53-$60; McAfee; 800/338-8754; www.mcafee.com

PRODUCT INFO NO. 630

- **Norton Utilities 4** Symantec; street pricing: $43-$45; 800/441-7234; www.symantec.com

PRODUCT INFO NO. 631

- **Nuts & Bolts 98** street pricing: $42-$50; McAfee; 888/712-1477; www.mcafee.com

PRODUCT INFO NO. 632

SONY

From one plumber to another–what the ★@#!?

E-mail

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Uninstallers Now You C: It...

If you need more file-removing power than Win 95/98's Add/Remove Programs has to offer, Symantec's CleanSweep is the best uninstaller—but buy it as part of Norton SystemWorks, our Best Buy utility suite. **BY PAUL HELTZEL**

AN OLD, UNWANTED application is like the creature in a B horror film. You think you've destroyed the monster for good and all, but the next time you boot, there it is again—lurking as an icon on your desktop or an entry on the Start menu.

If you use Windows, you already have access to a fairly good tool for exorcising The Undead App. The Add/Remove Programs applet in Control Panel works well enough—if the application you want to eradicate was designed properly. But if the software maker failed to design that app to permit uninstallation, Add/Remove Programs isn't much help.

Hence, uninstallers—utilities that rid your system of unwanted programs (and when we say "rid," we mean deleting unneeded DLLs from your Windows/System folder and shortcuts from the Start menu, too). These utilities also scan your hard drive for orphaned or unnecessary files.

The average user who rarely installs anything new and never adds a program to his or her system just for the heck of it probably doesn't need a stand-alone uninstaller. But others—hard-core shareware addicts who constantly add new and not-always-well-behaved programs to their systems and devotees of older applications—just might.

INSTALLING THE UNINSTALLERS

FOR THIS REVIEW we tested McAfee's UnInstaller 5.1, Quarterdeck's Remove-It 98, IMSI's WinDelete 5, and Norton CleanSweep 4.5. We examined each utility in three settings: First, we loaded "well-behaved" applications (apps designed to be removable) and used the utilities to remove them. Next, we asked the utilities to get rid of some older Windows 3.*x* programs that weren't designed for easy removal. Finally, we deleted application folders from our hard drive to see if the utilities could dump the detritus left behind. All four uninstallers work better if you turn them on before installing new apps; they then have a better idea of what to delete. We tested each product with its monitor—which keeps track of the files installed by new apps—turned on and turned off.

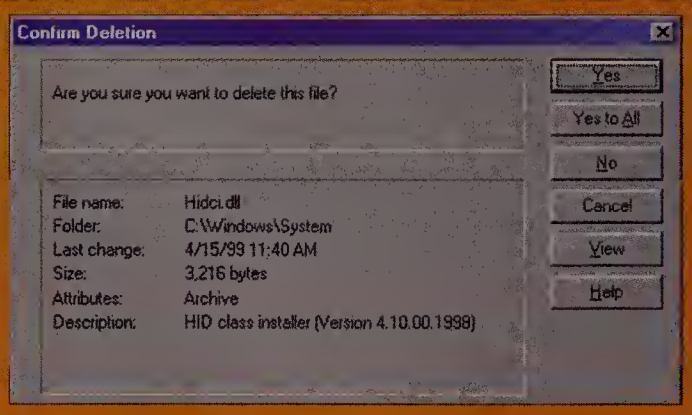
After all the testing, Norton CleanSweep 4.5 emerged as our Best Buy. It accurately monitored installed files and removed them quickly and effectively. It was particularly good at removing older apps that weren't specifically designed to be uninstalled. The interface is intuitive and easy to navigate.

Other uninstallers are more useful in certain narrow cases. If you need to clear a specific amount of space from your drive—to make room for a particular download or application, for instance—McAfee UnInstaller's SpaceMaker Wizard will calculate how much space you need and then carve out that much room by looking for and deleting unused files.

Remove-It 98 is especially good at removing stray files of programs that weren't monitored during installation. It's also fast, and it reliably tracks Internet downloads, cache files, and cookies. But Remove-It's interface is unnecessarily confusing; and given the sensitive nature of uninstalling apps, any confusion can lead to serious harm.

WinDelete 5 is good for beginners because, when run in basic user mode, the program won't let you delete crucial system files. Basic mode also offers more guidance, in the form of a wizard-like assistant, in identifying unneeded files. WinDelete includes an antivirus utility called InocuLAN, which may help justify its $30 price. Unfortunately, in our tests WinDelete left behind files that other programs picked up, even in cases where it had monitored the installation.

All things considered, Norton CleanSweep is our favorite uninstaller—but we don't recommend buying it. Instead, you should purchase Norton SystemWorks, which packs a copy of CleanSweep along with its other tools.



ARE YOU REALLY, REALLY SURE? Norton's CleanSweep gives you plenty of warning prior to removing files permanently.

Norton CleanSweep 4.5 street pricing: $26–$30; Symantec, 800/441-7234; www.symantec.com

PRODUCT INFO NO. 633

- **McAfee UnInstaller 5.1** street pricing: $30–$40; Network Associates; 888/712-1477; www.mcafee.com

PRODUCT INFO NO. 634

- **Remove-It 98** street pricing: $20; Symantec; 800/441-7234; www.symantec.com

PRODUCT INFO NO. 635

- **WinDelete 5** street pricing: $30; IMSI; 800/833-8082; www.imsisoft.com

PRODUCT INFO NO. 636

Sound BLASTER

Sound Blaster Live!™

on

off

Vroom! Vroom!

Is your PC's audio up to speed?

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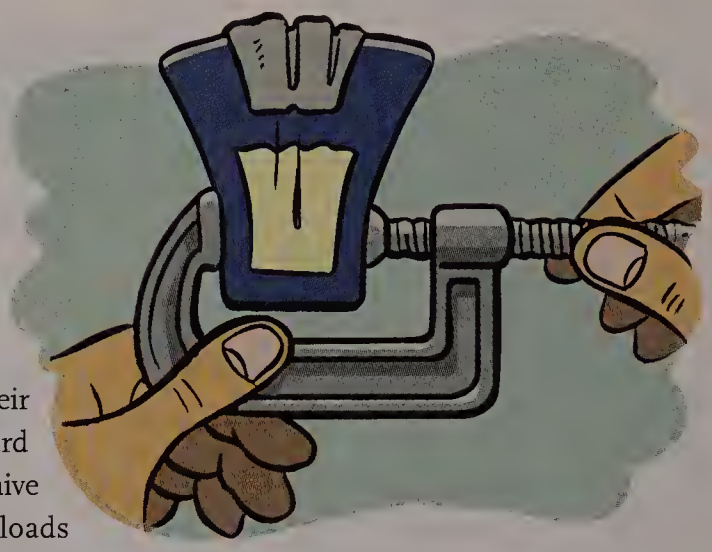
* Professional riders on a closed course. We strongly recommend that you try this at home.

File Compression Shrink to Fit

Both of the utility suites we looked at come with a compression utility. But if you aren't planning to buy a suite, consider purchasing WinZip 7 or PKZip.

BY MICHAEL GOODWIN



A GOOD FILE compression utility is essential for users at any level. These utilities allow you to create an archive file (often termed a *.zip file*) that's composed of one or more ordinary files in compressed form. Besides their obvious benefit of saving hard disk space, these smaller archive files allow you to speed uploads and downloads over the Internet, combine a group of files into one compressed archive file, and copy large files onto multiple floppies—a process known as *diskette spanning*. Some file compression programs (like PKZip, WinZip, and NetZip) also serve as fully functional backup utilities.

Windows does not provide any way to compress selected files—the Windows DriveSpace disk compression utility does not compress individual files. Fortunately, however, most third-party file managers (see "File Managers," page 166) also provide file compression, so if you're thinking of acquiring a file manager, you probably won't need a dedicated file compression utility. On the other hand, dedicated compressors typically come with useful extras—such as NetZip's feature that lets you resume a broken Internet download—missing from the versions that are built into file managers. And if you don't need a file manager, using a file compression utility makes far more sense.

The best compression utilities are quick and simple to use. We tested five of the latest and greatest. Certain kinds of files are more compressible than others, so we collected 15.7MB of assorted file types: a 5.7MB Microsoft Excel worksheet, a 2MB Microsoft Word file, 3MB of bit maps, a 1.7MB data file from Microsoft Money, and 4MB of executable programs. Then we instructed each compression utility to pack these into a single archive file. We measured how long the process took and recorded the size of the final file.

All the utilities produced archive files of nearly the same size—4.1MB, give or take a few kilobytes. No surprise there: Most compression utilities use a similar method to shrink files. We found quite a difference in performance, however: The fastest compressor (PKZip 2.6) did the job in 20 seconds, while the slowest (TurboZip 1) took nearly 2 minutes.

Incidentally, though some of these utilities are available in shrink-wrapped boxes with a printed manual, you'll probably download a trial version from a Web site first. That means you won't have a paper manual—so an intuitive interface counts for a lot.

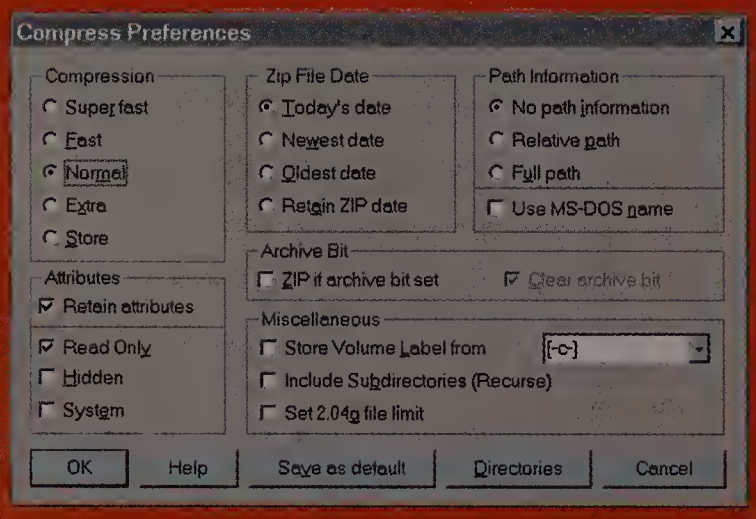
WINZIP: FAST AND EASY

WINZIP 7 PROVED to be among the easiest of the compression utilities to use: We never needed to open the manual or access Help. A convenient toolbar lets you produce new .zip files, add files to an existing archive, or extract files later with ease. It's fast, too: WinZip created the archive file in only 25 seconds. The program lets you narrow down your selection and compression of files to those with the archive bit set—and then reset the bit after archiving. That's exactly how backup utilities function, and this capability turns WinZip into a dandy backup program. The product also supports automatic diskette spanning.

PKZip for Windows v.2.6 works with drop-down menus as opposed to WinZip's toolbar, but it's equally easy to use. It incorporates the same handy archive-bit backup feature and the same painless disk-spanning capability. For some elusive reason—maybe the pretty toolbar—we slightly prefer WinZip to PKZip, but both programs are aces.

In contrast, DropStuff 1 took nearly twice as long (39 seconds) as PKZip to build the .zip file—and we didn't find it particularly intuitive to use. For instance, we had to access the Help menu to work out how to create a new archive. Most compressors ask you to choose a name and a location for your new archive before opening it. DropStuff, however, makes those decisions for you, so to create an archive you simply select the files you want to compress and click *Add*. Once you catch on, the arrangement is sensible enough—but you will have to get along without an archive-bit backup capability and disk spanning; neither is provided. ▶

COLOR ME COMPRESSED: PKZip for Windows offers a large set of options for compressing files. Click *ZIP if archive bit set* to turn the product into a fully functional backup utility.



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– Mark, age 17, Cisco Networking Academy student

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*Source: January 1998 IT Workforce Study by the Information Technology Association of America (ITAA).

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We found ZipMagic 2.02 similarly difficult to figure out. Adding files to an existing archive, for example, should be more straightforward than it is. A wizard simplifies the process, but compressing test files with the wizard took 83 seconds versus 41 without it. Your zipped files are displayed in Explorer as folders—we found this more of an annoyance than a help (it can be turned off, fortunately). Another minus: No archive-bit backup.

NetZip Deluxe 6.3 is relatively easy to use, and it supports diskette spanning and the archive-bit trick—but at nearly 52 seconds, it took far too long to compress our files. NetZip does the same view-zips-as-folders trick as ZipMagic.

PKZip for Windows v.2.6 street pricing: $31–$40; PKWare; 414/354-8699; www.pkware.com

PRODUCT INFO NO. 637

WinZip 7 street price: $30; Nico Mak Computing; www.winzip.com

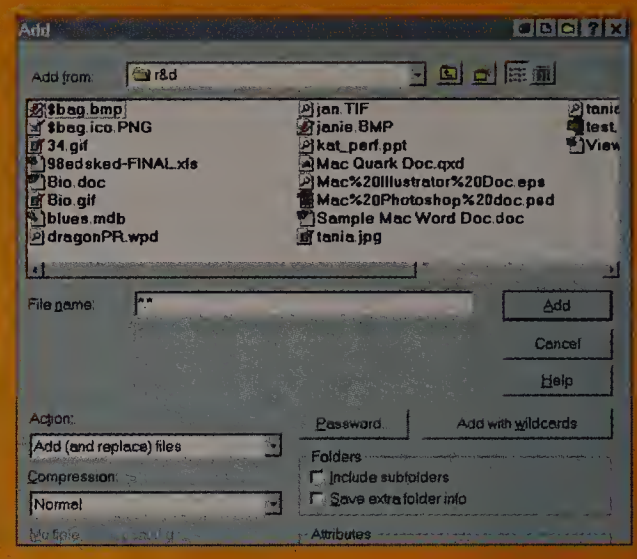
PRODUCT INFO NO. 638

- **DropStuff 1 for Windows** download only: $20; Aladdin Systems; www.aladdinsys.com
- **NetZip Deluxe 6.3** street pricing: $30–$40; Software Builders International; 800/432-0025; www.netzip.com

PRODUCT INFO NO. 639

- **ZipMagic 2.02** street pricing: $32–$40; Mijenix; 800/645-3649; www.mijenix.com

PRODUCT INFO NO. 640

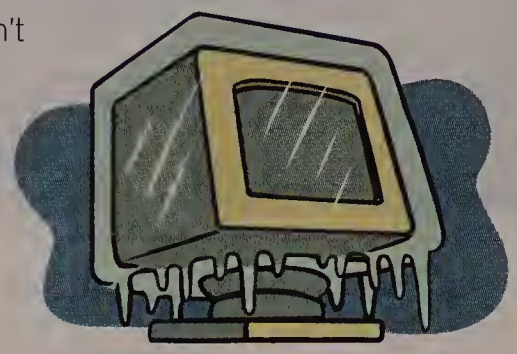


NO FUSS: WinZip's toolbar and dialog boxes allow you to create .zip archives, as well as add files to them in a jiffy, simply by selecting desired files in an Explorer-like interface and clicking *Add*.

Crash Prevention The Big Freeze

Buy a suite with crash protection—and don't forget to save your work often.

BY LENNY BAILES



IF YOU USE WINDOWS, you know all about crashes. These scourges have many causes—applications with conflicting system demands, corrupted Registry or other system files, poorly written or incompatible drivers. Sometimes they happen while Windows is loading, sometimes while you're happily working away. But whenever a crash happens, and whatever the cause, you can lose valuable data and precious time.

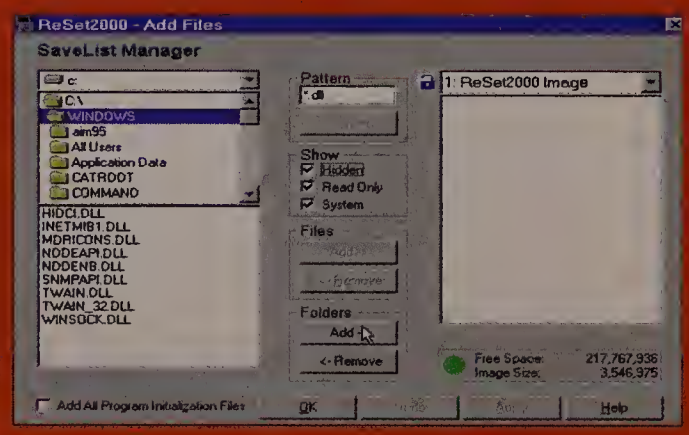
Though Windows 98 is much better than Win 95 at avoiding these dread events, it remains far from crashproof. Two kinds of third-party utilities can help. The first type intercepts application crashes as they happen and (you hope) keeps your whole system from coming down. The second, less proactive type just tries to clean up the mess afterward.

PREVENTING THE BIG BANG

WE LOOKED at two crash interceptors—Norton CrashGuard 4 and Quarterdeck Crash Defender 2 Deluxe. Both products are owned and distributed by Symantec, and both are designed to intercept application and system error messages. Once you've installed a crash interceptor, it replaces Windows' general protection fault reports with a dialog box that offers you the option of "unfreezing" the application, giving you a chance to save open data files before Windows restarts.

Both tools successfully rescued data from crashes we created in Microsoft Publisher 97/98 and Office 95 and 97. But choosing the unfreeze/antifreeze option at times allowed a problem to spread to the rest of the system, forcing a hard reboot.

RESET 2000 lets you archive important system files, so you can recover more easily after a major crash.



CrashGuard has a slightly greater feature repertoire than Crash Defender. Beyond the unfreeze/antifreeze option both programs offer, CrashGuard provides specific commands to relaunch and save data from a failing app. But in the same situations, Crash Defender's single unfreeze option saved our data just as well.

But whatever its features, a standalone crash monitor doesn't make much sense economically. For $20 more, you can buy the complete Norton SystemWorks, which includes a copy of CrashGuard. Crash protection is just one more reason to buy the suite. (Symantec plans to stop selling CrashGuard 4 as a standalone product as of August 1999.)

A word of caution: Crash interceptors—particularly those whose version numbers end in "0"—are among the leading causes of complaints to *PC World*'s *Bugs and Fixes* column. From the available evidence it appears that crash protectors create just as many problems as they solve.

AFTER THE CRASH

INSTEAD OF intercepting crashes, WinRescue 95/98 and Reset 2000 try to mop up the mess crashes leave ▶

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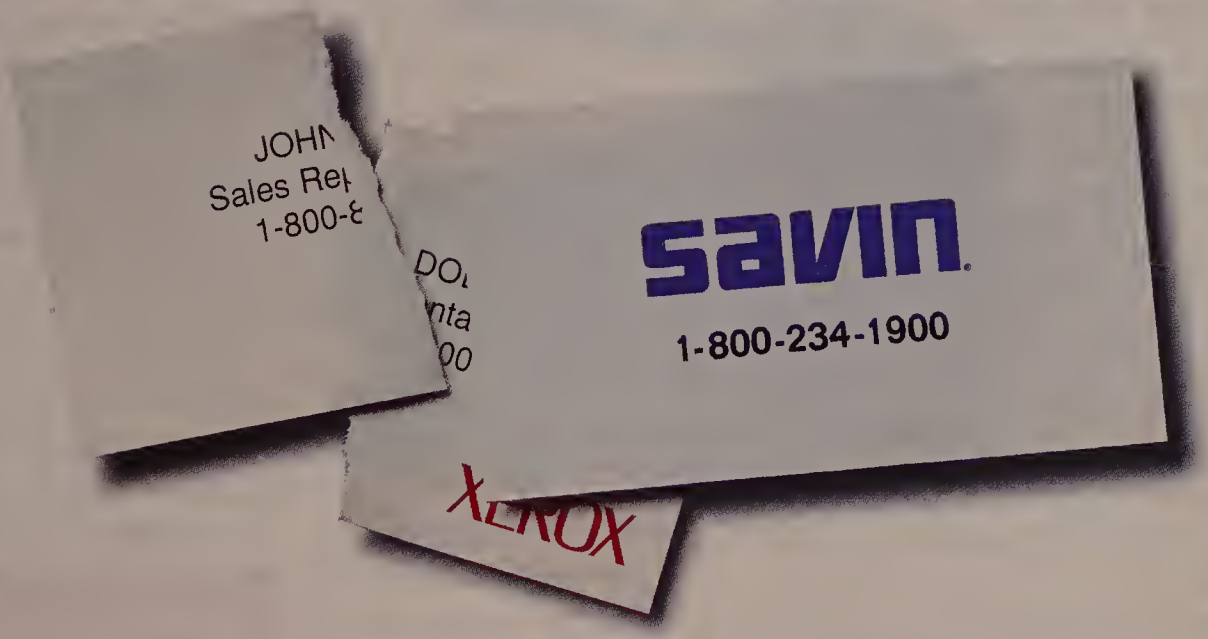

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behind. But neither utility is essential.

WinRescue creates a multitude of system archives, each containing the current or last-known good Windows Registry, plus .ini files, DOS system files, Desktop configuration, Start menu, and IE Favorites links. (Users can customize backups to include additional specified files and directories.) But if you're willing to tweak some settings, Windows 98's ScanReg can do pretty much the same thing.

ReSet Software's ReSet 2000 is more extensively automated. It automatically creates and maintains five copies of the Windows Registry, Desktop, Start menu, and system configuration files. After that, if Windows fails to start, a preboot screen allows you to restore the last good configuration. Unfortunately, though, ReSet 2000 costs about $50.

If your system crashes often enough to make that a worthwhile investment, you're better off buying Norton SystemWorks, which includes CrashGuard and a Rescue Disk feature, plus diagnostics, Registry optimization, and protection against trashed FATs and directory problems caused by viruses. Windows 95 users don't get Win 98's ScanReg tool; if you're one of them and you absolutely, positively don't need any other utilities, you might consider WinRescue.

- **Norton CrashGuard 4** street pricing: $27-$30; Symantec; 800/441-7234; www.symantec.com

PRODUCT INFO NO. 642

- **Quarterdeck Crash Defender 2 Deluxe** street pricing: $30-$40; Symantec; 800/441-7234; www.symantec.com

PRODUCT INFO NO. 641

- **ReSet 2000** street pricing: $50; ReSet Software Development; 888/968-6670; www.resetsoftware.com

PRODUCT INFO NO. 643

- **WinRescue 95/98** street pricing: $20; SuperWin Software; 800/242-4775 ext. 15136; www.superwin.com

PRODUCT INFO NO. 644

File Managers **Explorer Gets Lost**

If you need a replacement for Windows' own file tools, PowerDesk Utilities is the best—and it's free with Mijenix's Fix-It Utilities 99.

BY LINCOLN SPECTOR

WHY ON EARTH would you need a file manager? Look, you already have Windows Explorer to handle copying, moving, launching, and otherwise manipulating files. But if you work a lot with files—downloading them, examining them, relocating them, and zipping them into archives, Explorer's limitations become obvious. Third-party file managers can help you live amicably with those limitations. These programs give you a number of conveniences Microsoft left out—including split windows that let you view two folders at once, filtering so you can see only the files you want, and built-in file compression.

We looked at five file management programs for this review: Clear & Simple Software's DiskJockey 98, Canyon Software's Drag and File Gold, Science Translations' FileTiger, Mijenix's PowerDesk Utilities 98, and Pacific Gold Coast's Turbo Browser 98. Which is best? That's an easy one: PowerDesk trounced the competition on almost every measure. It's easy to use, integrates nicely with Windows, and does pretty much anything you could ask a file manager to do. The icing: It's also the cheapest application in the group.

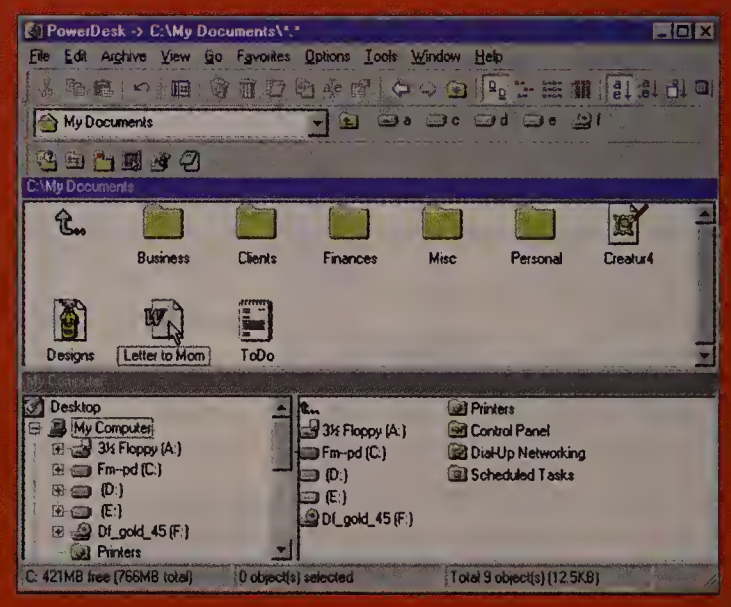
THE POWERDESK EDGE

POWERDESK 98 looks and works like the Windows 95 version of Explorer, so you'll feel at home immediately. And it truly assimilates into Windows. Right-click a file, and you'll get PowerDesk options such as Zip and Copy. Or you can summon PowerDesk anytime you click the *My Computer* icon.

PowerDesk improves on Explorer in countless little ways. You can split the window to see two folders at once, print a file list, and filter the list to see only certain types of files. You can easily toggle the folder-tree pane on and off, but it remains available as a pull-down menu.

Like Microsoft, Mijenix uses Inso's Quick View file-viewing technology. If you don't have Quick View installed, PowerDesk's installation program will load it for you. Like Windows' version of Quick View, PowerDesk carries a modest set of viewers heavily oriented toward Microsoft Office applications; however, it does add more graphics formats, including JPG, GIF, and TIF. Unlike Quick View, PowerDesk lets you copy and ▶

POWERDESK improves on Windows Explorer in countless little ways, such as letting you split the window to view two folders at once.



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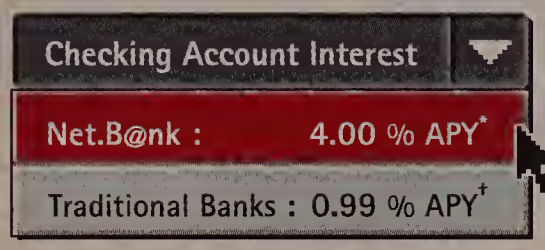

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print what you view. And PowerDesk integrates well with Inso's full-size Quick View Plus (see "File Viewers," below).

Best of all, PowerDesk 98 won't strain your credit card. The official retail price of $30 is low enough, but you can find it in stores and online for about $25. Alternatively, you can purchase PowerDesk as part of Mijenix's $49 Fix-It Utilities 99 suite (see "The Suites," page 155).

OTHER OPTIONS

THOUGH POWERDESK is the best general-purpose file manager, other products have some noteworthy specialized skills. Canyon Software's Drag and File Gold, the only file manager we've seen that supports the Internet's File Transfer Protocol, makes posting files to a Web site as easy as copying them to a floppy. Clear & Simple's DiskJockey 98 offers better file viewing than its competitors. Its larger set of viewers (also based on Inso's technology) lets you examine Corel and Lotus apps that you can't look at with basic Quick View.

But Drag and File Gold, DiskJockey 98, and Turbo Browser 98 share a common problem: a high price tag. Drag and File Gold carries a hefty $50 registration fee—$55 plus shipping if you want to get a CD-ROM and a manual. (Plain Drag and File—without Gold's Drag and Zip compression program—costs $30.) Disk Jockey and Turbo Browser both cost close to $60. FileTiger costs only $40, but all you get is a bare-bones file list.

A good file manager rates as a convenience, not a necessity. All you risk by forgoing one is a little extra work. But for $25, PowerDesk lets you avoid the excess labor and makes your computing life more pleasant. We'd spend the money.

PowerDesk Utilities 98 street pricing: $25-$30; Mijenix; 800/645-3649; www.mijenix.com

PRODUCT INFO NO. 645

- **DiskJockey 98** street pricing: $55; Clear & Simple; 888/658-1204; www.clear-simple.com

PRODUCT INFO NO. 646

- **Drag and File Gold** street pricing: $30-$55; Canyon; 800/280-3691; www.canyonsw.com

PRODUCT INFO NO. 647

- **FileTiger** street pricing: $39; Science Translations Software; 410/882-3789; www.filetiger.com

PRODUCT INFO NO. 648

- **Turbo Browser 98** street price: $60; Pacific Gold Coast; 800/732-3002; www.pgcc.com

PRODUCT INFO NO. 649

File Viewers **Open for Business**

Windows' Quick View offers extremely limited file viewing functionality. We recommend Quick View Plus or KeyView Pro.

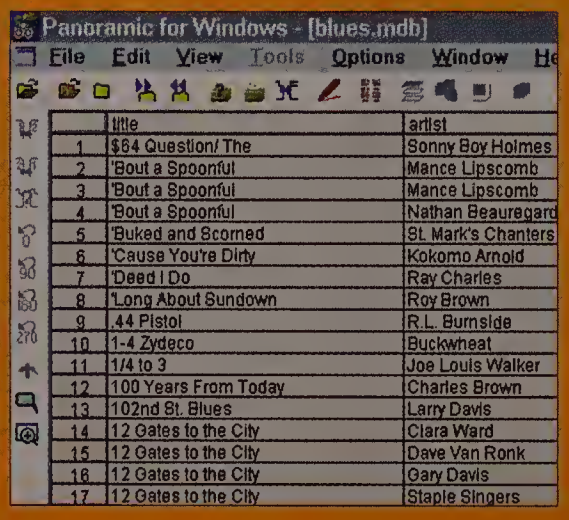
BY MICHAEL GOODWIN

FILE INCOMPATIBILITIES are a leading cause of mice with toothmarks all over them. The scenario: Under pressure to get a project finished, you receive a long-awaited file after-hours. Huzzah! But when you try to open it, you find it was created in a program your PC doesn't have—and you're ready to start gnawing.

File viewers to the rescue. These handy utilities let you view, print, and copy text from files created by applications you don't have. They even maintain the original version's formatting. They don't, however, let you convert files to a different format. For that, you need a converter like Conversions Plus from DataViz ($100 street price; www.dataviz.com; 800/733-0030; product info no. 650).

Windows 95 and 98 come with a simple file viewer called Quick View, which supports only 31 file types, including .asc, .bmp, .doc, .exe, .ini, .ppt, .wmf, .wri, and .xls file formats. Quick View is essentially a scaled-down version of Quick View Plus from Inso, from whom the product was originally licensed. Some PC users don't need anything more substantial, but if you often receive files you can't open, you should purchase a dedicated file viewer.

PANORAMIC was the only file viewer we tested that managed to open an Access file.



	title	artist
1	$64 Question/ The	Sonny Boy Holmes
2	'Bout a Spoonful	Mance Lipscomb
3	'Bout a Spoonful	Mance Lipscomb
4	'Bout a Spoonful	Nathan Beauregard
5	'Buked and Scorned	St. Mark's Chanters
6	'Cause You're Dirty	Kokomo Arnold
7	'Deed I Do	Ray Charles
8	'Long About Sundown	Roy Brown
9	.44 Pistol	R.L. Burnside
10	1-4 Zydeco	Buckwheat
11	1/4 to 3	Joe Louis Walker
12	100 Years From Today	Charles Brown
13	102nd St. Blues	Larry Davis
14	12 Gates to the City	Clara Ward
15	12 Gates to the City	Dave Van Ronk
16	12 Gates to the City	Gary Davis
17	12 Gates to the City	Staple Singers

We looked at four file viewers, testing them on 15 reasonably common file types, including a Word document, an Excel worksheet, a Macintosh Illustrator file, a PowerPoint presentation, and various image formats. The only file that none could open was a Macintosh Quark document. Panoramic 3.1 handled the most formats, but it's also the most expensive viewer, at $99. When we balanced price against performance, KeyView Pro and Quick View Plus (both priced at $59) tied for the Best Buy.

Quick View Plus from Jasc—the company that distributes Inso's product at the retail level—opened 10 of our 15 test files. It supports an additional 175 file types beyond Windows' meager 31. It also integrates with many Windows applications, kicking in automatically when you click on a file in any such application. Quick View Plus and KeyView Pro were the only two viewers that could handle a .ppt presentation.

In fact, Verity's KeyView Pro 6.5 opened the same 10 test file types as Quick View Plus. Its inter- ▶

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face is starkly simple: Drop down the File menu and click *Open*. Or you can elect to integrate KeyView with your applications so it works automatically when you try to open a file for which you lack the original app.

Panoramic 3.1 from Cimmetry reads big files slowly, but otherwise it works extremely well, with a simple interface that opened 11 of our test file formats—more than any other viewer we tested. It was the only viewer that could open Microsoft Access files and Illustrator files created on a Macintosh. Panoramic's mark-up feature lets you add comments and graphics to viewed files before you print them—without altering the original file.

Drag and View 4.50 from Canyon Software integrates easily with Windows Explorer. It was the only viewer we tested that could handle a Macintosh PhotoShop file. However, Drag and View opened only nine of our test files.

KeyView Pro 6.5 street pricing: $43-$59; Verity; 800/787-1166; www.verity.com

PRODUCT INFO NO. 651

Quick View Plus street pricing: $40-$59; Jasc; 800/622-2793; www.jasc.com

PRODUCT INFO NO. 652

- **Drag and View 4.50** street pricing: $30-$35; Canyon; 800/656-5443; www.canyonsw.com

PRODUCT INFO NO. 643

- **Panoramic 3.1** street price: $99; Cimmetry; 800/361-1904; www.cimmetry.com

PRODUCT INFO NO. 654

Undo/Undelete Back From the Brink

If you revise documents frequently, get Undo & Recover. If you're willing to spend $70, consider GoBack—an incredible time machine that allows you to recover from even the most debilitating viruses and crashes.

BY LENNY BAILES

MOST WINDOWS apps have undo functions. And you can fish for deleted files in Windows' own Recycle Bin. But a whole subgenre of utilities go far beyond this level of functionality, letting you recover the last 100 saved versions of a Word document or reproduce the contents of an entire trashed hard drive.

SAVE AND STILL UNDO

THREE UTILITIES—Aladdin Systems' FlashBack, PGSoft's Save Butt, and Kiss Software's Undo & Recover Toolbox 2—let you recover old, saved versions of almost any document in your system. If you want to revert to the version of a Word document you saved a week ago, all three of these utilities can do the job.

Of the three, Undo & Recover Toolbox works the best. It automatically tracks all files on your system, including the Registry. In contrast, Save Butt automatically tracks only documents registered to applications on the Windows Start menu; you can, however, add new file types manually by using a System Tray applet. FlashBack makes you register specific document types by dragging each into a FlashBack file window. Undo & Recover and FlashBack both track an unlimited number of file versions; Save Butt tracks the most recent 99.

Undo & Recover Toolbox gives you more ways to recover old files. A Quick Undo menu in the System Tray lets you reverse the last five saves to your hard drive. The Undo Storage Wizard lets you view and select deleted and changed files by name or application. And the Start Over feature automatically restores the Windows Registry and system configuration files. Our only complaint: Undo & Recover doesn't track changes made in DOS sessions. And at $40, it's pricey.

THE ULTIMATE UNDOS

THREE OTHER utilities—PowerQuest's Lost and Found, OnTrack's Tiramisu, and Wild File's GoBack—surpass simple revision tracking, letting you restore files lost to viruses, hardware failure, or a slip of the finger on the <Delete> key.

GoBack is our favorite undeleter. The program keeps a sector-by-sector record of all changes written to a hard disk from Windows or DOS, which it stores on a special, protected section of your hard drive. So if a virus trashes your disk on Tuesday, GoBack can return your system to its Monday state and (once you've cleaned it of viruses) restore the files you modified before the crash. At $70, it isn't cheap. But for that kind of time-machine functionality, we'd say it's worth it.

GoBack street price: $70; Wild File; 888/945-3345; www.goback.com

PRODUCT INFO NO. 655

Undo & Recover Toolbox 2 street pricing: $35-$40; Kiss Software; 888/454-7726; www.kissco.com

PRODUCT INFO NO. 656

- **FlashBack 1.11** street pricing: $50; Aladdin Systems; 800/732-8881; www.aladdinsys.com

PRODUCT INFO NO. 657

- **Lost and Found 1.01** street pricing: $61-$70; PowerQuest, 800/379-2566; www.powerquest.com

PRODUCT INFO NO. 658

- **Save Butt 1.20** street pricing: $30-$38; PGSoft; 800/549-9001; www.savebutt.com

PRODUCT INFO NO. 659

- **Tiramisu Data Recovery 3.04** street pricing: $195 (with unlimited machine license and unlimited recoveries); OnTrack Data International; 800/872-2599; www.ontrack.com

PRODUCT INFO NO. 660

Cameron Heffernan is an associate editor for PC World, *and Dan Miller is a senior editor for* PC World. ■

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DIGITAL CAMERAS

MVC-FD91
$999

SONY DIGITAL MAVICA CAMERA

The Digital Mavica® camera is the only digital camera in the world to use a standard floppy disk for film. Designed for the serious photo enthusiast, this semi-pro model is loaded with top-of-the-line features, like MPEG audio/video capabilities, a 14X Optical Zoom lens, Optical SteadyShot® and special manual controls.

DSC-F55
$899

SONY CYBER-SHOT DIGITAL CAMERA

Thanks to its compact size and ease of use, the Sony Cyber-shot™ Digital Still camera makes a great companion for your Sony notebook computer. To quickly transfer images to your PC, simply take the Sony Memory Stick™ media from the Cyber-shot camera and plug it into your notebook's PC Card slot (Sony PC Card adapter required).

IC CHIP RECORDER AND PC GLASSTRON MONITOR

ICD-R100PC
$199.95

SONY VOICE FILE™ DIGITAL IC CHIP RECORDER

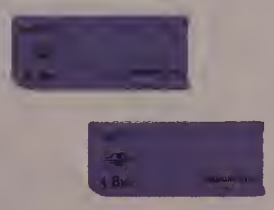
The Sony IC Chip Recorder captures every word with digital clarity—and links right to your Sony PC. This palm-sized device (just 85g.) provides a swift, effortless way to save, download and e-mail your audio messages. Highlights include: 2.5 hours of recording time; digital VOR for start-stop speech; and playback control for seamless editing.

PLM-S700
$2,599
as low as
$46.92 a month*
◊See advisories on back page

SONY PC GLASSTRON PERSONAL MONITOR

A big-screen display that's portable? The PC Glasstron™ monitor creates a virtual 30" high-resolution image—for your eyes only. It's head-mounted to offer you the most in mobility and privacy. And its built-in headphones make your multimedia experience even more amazing. Just plug it into your notebook and other video sources and let the games begin.◊

MEMORY STICK IC RECORDING MEDIA



Introducing the next generation of digital data storage—Memory Stick Media. Smaller than a stick of gum but with five times the storage capacity (MSA-8A model) of a standard 3.5" floppy disk, Memory Stick Media is expected to become the new industry standard for storage and transfer media. Plus, it makes it even easier for you to transfer images, sounds, data and text between cameras, computers and more.

4 MB Memory Stick Media	Model: MSA-4A	Price: $29.99
8 MB Memory Stick Media	Model: MSA-8A	Price: $39.99
16 MB Memory Stick Media	Model: MSA-16A	Price: $79.99

VAIO 505 SUPERSLIM NOTEBOOK

So light, yet so powerful.

Only 3.5 lbs. and 1" thin, the Sony VAIO Z505 SuperSlim Pro Notebook is available with one of the largest displays in its class (12.1"). The Z505SX comes loaded with built-in ethernet, a Pentium® II processor, 128 MB RAM, Programmable Power Keys (PPK) and signature capture in a durable magnesium alloy case.

Z505SX $2,999.99

As low as $54.14 a month*

- **Mobile Intel® Pentium II processor 366 MHz**
- 128 MB RAM (expandable to 192 MB max.)
- **6.4 GB fixed hard drive**
- 1" thin; 3.5 lbs.
- Built-in Ethernet (10Base-T/100Base-TX)
- **12.1" XGA TFT Display**
- V.90 modem
- High-capacity Lithium-Ion battery
- Digital touch pad
- Bundled i.LINK Port Replicator and external floppy disk drive
- One type II PC Card slot with card bus support
- Memory Stick Media Slot
- Two USB ports
- Built-in stereo speakers

Z505S $2,499.99

As low as $45.12 a month*

- **Mobile Intel Celeron™ processor 333 MHz**
- 64 MB RAM (expandable to 192 MB max.)
- **6.4 GB fixed hard drive**
- 1" thin; 3.5 lbs.
- Built-in Ethernet (10Base-T/100Base-TX)
- **12.1" XGA TFT Display**
- V.90 modem
- High-capacity Lithium-Ion battery
- Digital touch pad
- Bundled i.LINK Port Replicator and external floppy disk drive
- One type II PC Card slot with card bus support
- Memory Stick Media Slot
- Two USB ports
- Built-in stereo speakers

Customize with:

★ Upgrade to 128 MB RAM add: $200.00

Receive 2,500 FREE Frequent Flyer Miles from your choice of one of six airlines (American, Continental, Delta, Northwest, United, U.S. Airways) with purchase of VAIO Z505S or Z505SX. (Offer expires 9/30/99) See www.sony.com/vaiorebate for details on offer.

505TR $1,999.99

As low as $36.09 a month*

- **Mobile Intel Pentium processor with MMX technology 300 MHz**
- 64 MB SDRAM (expandable to 128 MB max.)
- **6.4 GB fixed hard drive**
- 0.9" thin; 3.1 lbs.
- **10.4" XBRITE™ XGA TFT Active Matrix Display**
- V.90 modem
- Double-capacity Lithium-Ion battery
- Touch pad with pen operation
- Bundled Port Replicator and external floppy disk drive
- One type II PC Card slot with card bus zoomed video support

Customize with:

★ Upgrade to 128 MB RAM add: $300.00

$100 Rebate with purchase of VAIO 505TR and CD-ROM Drive (PCGA-CD5 or CD51). (Offer expires 9/30/99)

Pre-Installed Software
(All models):

- Windows® 98
- Microsoft® Outlook™ 98
- Microsoft Works®
- Adobe® PhotoDeluxe®
- Sony PictureGear™
- Sony DVgate™ Still

Pre-Installed Software
(Z505SX and Z505S models):

- Sony Smart Capture
- Sony Smart Connect
- Sony Smart Publisher
- Sony Smart Write

Sony Exclusive Features:
(All models):

- i.LINK® (IEEE-1394) interface for DV still image capture
- Programmable Power Key (PPK) for unattended e-mail retrieval

Sony Exclusive Features:
(505TR):

- Pen-based signature and drawing capture

Find more of everything you need in a computer

VAIO C1 PICTUREBOOK COMPUTER

The tiny, powerful PC with a built-in camera.

This paperback-sized marvel is loaded with a Mobile Intel Pentium processor with MMX™ technology 266 MHz, a huge 4.3 GB hard drive, 64 MB SDRAM and Windows 98. Plus it lets you take and send pictures instantly—just swivel the camera toward your subject and capture a still shot or a 60-second video clip and use the integrated modem to send your images.

Pre-installed Software:

- Windows 98
- Adobe PhotoDeluxe
- Sony Smart Write
- Sony Smart Publisher
- Sony Smart Capture

PCG-C1X $2,299.99

As low as $41.51 a month*

- Mobile Intel Pentium processor with MMX technology 266 MHz
- 64 MB SDRAM (expandable to 128 MB max.)
- 4.3 GB fixed hard drive
- Built-in CCD camera (Motion Eye™)
- 8.9" XWIDE TFT LCD Display (1024 x 480)
- 17mm pitch/2mm stroke keyboard
- 2.5 lbs., 1.5" thin
- Integrated V.90 modem
- i.LINK (IEEE-1394) interface for DV still image capture
- Magnesium-alloy LCD casing
- Bundled external USB floppy disk drive
- Lithium-Ion Battery

$100 Rebate with purchase of VAIO C1 PictureBook Computer. (Offer expires 9/30/99)

$100 Rebate with purchase of VAIO C1 PictureBook Computer and CD-ROM Drive (PCGA-CD5). (Offer expires 9/30/99)

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VAIO DIGITAL STUDIO COMPUTER

Enhance the way you live, work and play.

With Digital Video Editing, Video Email, PC networking and a host of capabilities using Sony DVgate Still/Motion, Media Bar, PictureGear, and Smart Capture software, you can build the Sony Digital Studio according to your needs.

PCV-R528DS $2,299.99

As low as $41.51 a month*

- **Intel Pentium III Processor 500MHz**
- 16 MB Video Memory (SDRAM)
- 128 MB PC-100 SDRAM (expandable to 256 MB max.)
- 13 GB Ultra ATA hard drive
- 6X (max.) DVD-ROM
- CD-RW Drive

With the CD-RW drive, it's easy to make your own CDs for backup, storing large files with audio and video, and even creating your own digital photo or video albums to share with your family and friends.

PCV-R526DS $1,699.99

As low as $30.68 a month*

- **Intel Pentium III Processor 450 MHz**
- 8 MB Video Memory (SDRAM)
- 128 MB PC-100 SDRAM (expandable to 256 MB max.)
- 10 GB Ultra ATA hard drive
- 6X (max.) DVD-ROM

PCV-R522DS $1,199.99

As low as $21.65 a month*

- **Intel Celeron Processor 466MHz**
- 8 MB Video Memory (SDRAM)
- 64 MB PC-100 SDRAM (expandable to 256 MB max.)
- 10 GB Ultra ATA hard drive
- 32X (max.) CD-ROM

intel inside pentium® III

Pre-Installed Software
(All models):

- Sony DVgate Motion
- Sony DVgate Still
- Sony PictureGear
- Sony Smart Capture
- Sony Smart Connect
- Sony Media Bar™
- Sony DV Tutorial CD
- Adobe Premiere® LE
- Adobe PhotoDeluxe
- Adobe Acrobat® Reader
- Star Wars® Jedi Knight™: Pathways to the Force™
- Star Wars Rogue Squadron™ 3D: Elite Missions™
- Intuit® Quicken® Basic 99
- Symantec WinFax® Basic Edition
- Microsoft Encarta® 99
- Microsoft Money 99
- Microsoft Outlook 98
- Microsoft Works

Sony Exclusive Features
(All models):

- V.90 Modem
- Fully Expandable (4 bays and 4 slots)
- 2 i.LINK (IEEE-1394) Ports (one 4-pin, one 6-pin)
- 2 USB Ports (front and rear)
- 128-bit 3D 2X AGP Graphics Acceleration (ATi Rage 128 VR) in R522/ 526 and (ATi Rage 128 GL) in R528
- 3D Positional Audio (Aureal A3D)
- Programmable VAIO Smart™ Keyboard
- Wheel Mouse
- External stereo speakers with enhanced bass

Up to $180 Rebate with purchase of a Digital Studio PC, VAIO Display and Canon Bubble Jet ™ Printer.

***Eligible Sony VAIO Computers: PCV-R528DS, PCV-R526DS, PCV-R522DS; eligible Sony displays: CPD-200ES/L, CPD-100ES/L; eligible Canon printer: BJC-2000. For details on rebate, visit our web site at www.sony.com/vaiorebate

FREE i.LINK cable with purchase of PCV-R528DS

FREE 3 CD-RW pack with purchase of PCV-R528DS upgrade

at Sony VAIO Direct: www.sony.com/direct-2pw

VAIO ALL-IN-ONE NOTEBOOK

No need to lug around peripherals—everything is built right in.

We've packed a DVD-ROM or a CD-ROM, the hard and floppy drives, the V.90 modem, stereo speakers and a high-capacity Lithium-Ion battery inside. You can also get an Intel Pentium II processor and a brilliant 15" display with select models.

3MAX+ Features
(all models):

- MaxScreen: 15" XGA TFT(F290 only)
- MaxBattery: 2X battery life†
- MaxMobility: About 7 lbs.;†† under 2" thin

Plus:

- All-in-One design
- i.LINK (IEEE-1394) interface

3MAX+

Pre-installed Software
(all models):

- Windows 98
- Microsoft Outlook 98
- Microsoft Works
- Adobe PhotoDeluxe
- Sony Picture Gear
- Sony DVgate Still

†Using optional second battery in floppy drive bay. Battery life based on usage. ††With weight saver in floppy drive bay.

F290 $3,499.99

As low as $63.17 a month*

- **Mobile Intel Pentium II processor 400 MHz**
- 128 MB SDRAM
- **6.4 GB fixed hard drive**
- **4X DVD-ROM** (max.)
- 15" XGA TFT screen
- Integrated V.90 modem
- High-capacity Lithium-Ion battery, dual battery capability
- 256-bit graphics chip
- Built-in stereo speakers
- Digital touch pad
- i.LINK (IEEE-1394) interface for DV motion capture and editing

F280 $2,799.99

As low as $50.53 a month*

- **Mobile Intel Pentium II processor 366 MHz**
- 64 MB SDRAM (expandable to 128 MB max.)
- **6.4 GB fixed hard drive**
- **4X DVD-ROM** (max.)
- 14.1" XGA TFT screen
- Integrated V.90 modem
- High-capacity Lithium-Ion battery, dual battery capability
- 256-bit graphics chip
- Built-in stereo speakers
- Digital touch pad
- i.LINK (IEEE-1394) interface for DV motion capture and editing

Customize with:
★ Upgrade to 128 MB RAM add $200

F270 $2,399.99

As low as $43.31 a month*

- **Mobile Intel Pentium II processor 333 MHz**
- 64 MB SDRAM (expandable to 128 MB max.)
- **6.4 GB fixed hard drive**
- **4X DVD-ROM** (max.)
- 14.1" XGA TFT screen
- Integrated V.90 modem
- High-capacity Lithium-Ion battery, dual battery capability
- 256-bit graphics chip
- Built-in stereo speakers
- Digital touch pad
- i.LINK (IEEE-1394) interface for DV motion capture and editing

Customize with:
★ Upgrade to 128 MB RAM add $200

F250 $1,699.99

As low as $30.68 a month*

- **Mobile Intel Celeron processor 366 MHz**
- 32 MB SDRAM (expandable to 96 MB max.)
- **4.3 GB fixed hard drive**
- **24X CD-ROM** (max.)
- 13" XGA HPA screen
- Integrated V.90 modem
- High-capacity Lithium-Ion battery, dual battery capability
- 256-bit graphics chip
- Built-in stereo speakers
- Digital touch pad^
- i.LINK (IEEE-1394) interface for DV still image capture

Customize with:
★ Upgrade to 96 MB RAM add $200

10 FREE DVD rentals from NetFlix.com with purchase of F290, F280 or F270.# (Offer expires 9/30/99) See www.sony.com/vaiorebate for details on offer.

$100 Rebate with purchase of F250 Notebook. (Offer expires 9/30/99)

More accessories to customize your PC.

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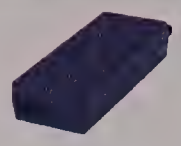
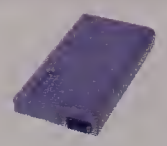
VAIO ALL-IN-ONE NOTEBOOK ACCESSORIES



- **AC Adapter**
  PCGA-AC71: **$99.99.** Get an additional AC adapter and keep one at home and one at work.



- **Rechargeable Battery Pack**
  PCGA-BP71: **$249.99.** Up to 7 hours with two batteries. Note: Battery life may vary based on usage.

- **Network Port Replicator**
  PCGA-PRF1: **$199.99.** Built-in Ethernet 10 Base-T, USB parallel, serial VGA, DC-in, PS/2® keyboard and PS/2 mouse ports.

- **All-in-One Carrying Case**
  PCGA-CCF: **$99.99.** Easily holds notebook and accessories.

VAIO C1 PICTUREBOOK ACCESSORIES

- **External 14X (max.) CD-ROM Drive**
  PCGA-CD51: **$299.99.** Plug it into your computer and get set for some serious multimedia.

- **AC Adapter** PCGA-AC51: **$99.99.** Get an additional AC adapter and keep one at home and one at work.

- **C1 Carrying Case**
  PCGA-CC1A: **$149.99.** Includes a convenient Velcro™ detachable fitted leather glove-casing.

- **Long-Life Rechargeable Battery Pack**
  PCGA-BP12: **$299.99.** Lithium-Ion battery provides up to 6 hours capacity. Note: Battery life may vary based on usage.

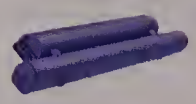
- **Battery Charger**
  PCGA-BC1: **$199.99.** Quickly charge two batteries simultaneously. Compatible with Standard and Long-Life batteries.

- **Standard Rechargeable Battery Pack**
  PCGA-BP11: **$149.99.** Lithium-Ion battery provides up to 3 hours capacity. Note: Battery life may vary based on usage.

VAIO 505 SUPERSLIM NOTEBOOK ACCESSORIES

- **External 14X (max.) CD-ROM Drive** PCGA-CD51: **$299.99.** Plug it into your computer and get set for some serious multimedia.

- **Leather Carrying Case**
  PCGA-CC5: **$149.99.** Custom case includes detachable compartments for all of its accessories.



- **Rechargeable Battery Pack**
  Long-Life: PCGA-BP52: **$299.99.** Up to 6 hours with 505TR. Note: Battery life may vary based on usage.

  Standard: PCGA-BP51: $149.99. Up to 2.5 hours with 505TR. Note: Battery life may vary based on usage.

- **Port Replicator**
  PCGA-PR5: **$99.99.** Ports: Parallel printer, PS/2 keyboard, PS/2 mouse and VGA monitor.

- **Battery Charger**
  PCGA-BC5: **$199.99.** You can charge 2 batteries simultaneously. Compatible with both Long-Life and Standard batteries.

- **Stereo Speakers**
  PCGA-SP51: **$99.99.** External clip-on speakers that give you even more sound.

- **AC Adapter**
  PCGA-AC51: **$99.99.** Get an additional AC adapter and keep one at home and one at work.

VAIO Z505 SUPERSLIM PRO NOTEBOOK ACCESSORIES

- **Rechargeable Battery Pack**
  Triple-Life: PCGA-BPZ52: **$399.99.** Up to 5 hours with Z505SX; up to 6 hours with Z505S. Note: Battery life may vary based on usage.

  Standard: PCGA-BPZ51: **$199.99.** Up to 1.5 hours with Z505SX and Z505S. Note: Battery life may vary based on usage.

- **External 14X (max.) CD-ROM Drive**
  PCGA-CD51: **$299.99.** Plug it into your computer and get set for some serious multimedia.

- **Port Replicator with i.LINK**
  PCGA-UPR5: **$99.99.** Ports: Parallel, Serial, VGA Monitor, i.LINK and USB.

- **Monitor Adapter**
  PCGA-DA5: **$49.99.** Connects VGA monitor without Port Replicator.

- **AC Adapter**
  PCGA-AC5Z: **$99.99.** Get an additional AC adapter and keep one at home and one at work.

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More innovations.

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Light, Slight, and Stylish

These svelte 15-inchers look great on your desktop, and they won't break the piggy bank. We've got the lowdown on 19 pixel-popping models. By Rick Overton

At closing time on a Friday evening, traders at Banc of America Securities took one last look at their cluttered cubicles and went home. Each desk had two PCs, three bulky 15-inch CRT monitors, and a million-dollar view of San Francisco's financial district.

The following Monday the traders returned to a brave new world. In place of the CRTs, every desk now sported sleek and thin 18-inch LCD panels. The traders' jaws dropped at the sight of these futuristic displays. Compared to their old CRT monitors, the LCDs gave traders 70 percent more usable screen area *and* more free desk space.

"The switch was well worth it," according to Steven Linder, Banc of America Securities' vice presi- ▶

PHOTOGRAPHS BY KEVIN TWOMEY

dent of desktop engineering. "LCDs offered additional screen area, significantly smaller space requirements, and more freedom for traders to do what they do best."

SHOWDOWN: LCDs VERSUS CRTs

DESPITE THEIR advantages, liquid crystal display monitors are just starting to lose their novelty. When LCD panels cost at least four times as much as cathode-ray tube units, only the truly deep-pocketed bought them. This year, when the average price of a 15-inch LCD monitor fell to a new low of under $1100, consumers began to snatch them up in record numbers.

There's more to LCDs' increasing popularity than the price reductions. An LCD's svelte profile can really turn heads at the office. More practically, LCDs occupy only a third of the space of CRTs and weigh a quarter as much—you can lift a 12-pound LCD off your desk without throwing out your back. The sleek units also use 60 percent less energy and generate far less heat, a welcome benefit for cramped offices.

But what about display quality? Based on our tests, we can't make sweeping judgments about whether CRTs or LCDs render text and graphics better—quality varies widely within both classes. But LCDs and CRTs do have a few important differences. For one thing, LCD screens look brighter, which most users appreciate. But LCDs are also optimized at only one resolution—a big drawback for graphics professionals and CAD specialists.

Best Buys

ONE'S DIGITAL; the other's analog. Both are excellent choices. The digital, $1085 **Princeton DPP560** (right) shines with the highest-rated image quality and a graceful design. Meanwhile, **Samsung's SyncMaster 530TFT** ($1149) stands atop the analog pack with great-looking text and graphics, a stately design, a convenient swivel base, and built-in speakers.

THE FLAT PACK

WE EXAMINED 19 LCD monitors, ranging in price from $949 to $1599. These 15-inch active-matrix panels offer about the same viewable area as 17-inch CRTs. Sixteen of the 19 are analog displays, which use an analog connector for easy

TOP 10 LCD MONITORS FEATURES COMPARISON

	15-INCH LCD MONITOR	Street price (5/15/99)	Overall rating [1]	Quality of text/ graphics	Comments	Basic features: Video board interface	Basic features: Horizontal/vertical viewing angle (in degrees, vendor specs)	Basic features: Refresh rate at 1024 by 768 (Hz)
1	Princeton DPP560 800/747-6249 www.prgr.com	$1085 [4]	85	Excellent/ Excellent	PRO: Sharp text, lively colors, pivot feature. CON: Limited tech support.	Digital	70/60	60
2	Samsung SyncMaster 530TFT 800/933-4110 www.samsung.com	$1149	84	Very good/ Very good	PRO: Cool design, integrated speakers, swivel base. CON: Heavier than most.	Analog	60/55	75
3	ViewSonic VPD150 800/888-8583 www.viewsonic.com	$1069 [6]	83	Very good/ Very good	PRO: Small footprint, good images. CON: Generic design, no swivel.	Digital	60/60	60
4	Dell 1500FP 800/388-8542 www.dell.com	$999	83	Very good/ Good	PRO: Low price, easy swivel, good on-screen controls. CON: So-so colors.	Analog	70/60	60
5	ViewSonic VPA150 800/888-8583 www.viewsonic.com	$1099	82	Very good/ Good	PRO: Small footprint, fine image quality. CON: Generic design, no swivel feature.	Analog	60/45	75
6	LG 500LC 800/243-0000 www.lgeus.com	$1050	82	Very good/ Good	PRO: Light, below-average price tag. CON: Lacks features that others have.	Analog	60/45	75
7	Mag InnoVision LT530C 800/827-3998 www.maginnovision.com	$1050 [4]	81	Very good/ Very good	PRO: Nice text and graphics, USB ports. CON: Huge footprint, no swivel feature.	Digital	65/60	60
8	Apple Studio Display 800/538-8583 www.apple.com	$1299	81	Good/ Very good	PRO: Hip design, lockable. CON: High price, weak text, chintzy tech support.	Analog	60/45	75
9	Mag InnoVision LT541C 800/827-3998 www.maginnovision.com	$949	79	Good/ Satisfactory	PRO: Lowest price on chart, USB ports. CON: Bulky footprint, mediocre colors.	Analog	65/60	85
10	AcerView F51 800/379-2237 www.acerperipherals.com	$999	79	Good/ Very good	PRO: Great colors, below-average price. CON: Lacks swivel and pivot features.	Analog	80/80	75

Best Buy

● Yes ○ No

[1] Ten judges rate an LCD's text and graphics quality. We evaluate each unit on how well it displays typical business letters, a newsletter, spreadsheets, Web pages, and scanned photos. The overall rating is based on text and graphics quality (25 percent each), features and ease of use (25 percent), price (20 percent), and service and support (5 percent). The best possible overall rating is 100. Data based on tests designed and conducted by the PC World Test Center. All rights reserved.

[2] All ten LCDs have on-screen volume controls and a reset-to-default button.

hookup to a PC; three are digital units, which require a special digital video card. We evaluated all the LCDs in terms of image and text quality, price, design, controls, and service and support.

When we had finished and all the dead pixels were counted, two monitors stood out. Princeton's $1085 digital DPP560, our number one Best Buy, outclassed the competition with its top-rated image quality and comprehensive three-year warranty. Samsung's analog SyncMaster 530TFT ($1149), our second-place Best Buy, got high marks for its fine text and graphics, attractive design, robust audio features, and three-year warranty. For reviews of the nine LCDs that didn't make our Top 10 chart, visit PC World Online at www.pcworld.com/aug99/lcd_monitors.

BUYERS' CHOICE: ANALOG OR DIGITAL

ONCE YOU'VE DECIDED to go LCD, you have to choose between analog and digital. Both choices have pros and cons.

Getting started with an analog LCD requires only a simple cable connection to your computer's VGA port. But this compatibility turns out to be a mixed blessing. The LCD converter must digitize the analog signal, a process that can result in screen jitter or ghosting, particularly if the monitor is left on all day. We noticed jitter on Compaq's TFT500, Mitsubishi's LCD51, and others, though in most cases we were able to correct the distortion by using the on-screen menu to adjust the display's phase control.

Once you've decided to go LCD, you have to choose between analog and digital. Each option has its own set of pros and cons.

Digital units, on the other hand, tend to cost a bit less because they don't use a signal converter. But digital displays are more difficult to set up—you'll need to install a special video card and drivers. Driver conflicts prevented us from being able to set up and review one unit, IBM's digital T55D. According to IBM, the driver problem has since been corrected.

Digital LCD monitors also lack a single industry standard for how they connect to computers. Currently there are two contenders, the Digital Display Working Group's Digital Video Interface, and Digital Flat Panel from the Video Electronics Standards Association, historically the display standards leader. Princeton's DPP-560 uses DFP; ViewSonic's VPD150 and Mag InnoVision's LT530C use PanelLink, from which DVI emerged. Some vendors are still waiting for a standard to be established before they introduce a line of digital LCDs. Such a standard would make digital panels easier to move between different systems, as CRT monitors and analog LCDs do.

SPLENDOR IN THE GLASS

Best Display Quality: Princeton DPP560
Worst Display Quality: Compaq TFT 5000

FOR AN LCD to be a good business tool, it must render text well. On each of the 19 LCDs, we looked closely at a complex spreadsheet, an office newsletter, and a Windows 95 desktop. Six of our Top 10 displays earned a text score of Very ▶

								Support				
Dimensions (width x depth x height, inches)	Weight (lbs.)	Swivel	Screen pivot	USB ports: upstream/ downstream	Antitheft lock	Integrated speakers	External volume control [2]	Warranty (years)	Backlight warranty (years)	Daily tech support (hours)	Weekend Support	Product info number [3]
15.2 x 8 x 14.4	12.1	●	●	1/1	○	○	○	3	3	9 [5]	● [5]	602
15.9 x 7.7 x 16.5	16.3	●	●	0/0	○	●	●	3	3	24	●	603
15.2 x 6.7 x 15.6	13.2	○	●	0/0	○	●	●	3	3	24	●	604
15.5 x 6.9 x 16.3	11.9	●	○	Optional	●	○	○	3	3	24	●	–
15.2 x 6.7 x 15.6	12.8	○	●	0/0	○	●	●	3	3	24	○	605
15.9 x 6.8 x 16.5	11.5	○	○	0/0	○	○	○	3	1	24	●	606
15.4 x 11 x 7.7	12.3	○	●	1/4	○	○	○	3	1	11	○	607
15.7 x 6.9 x 11.6	12	●	○	0/0	●	○	○	1	1	12	○	608
15.4 x 11 x 17.7	13.2	○	●	1/4	○	○	○	3	1	11	○	609
14.9 x 6.8 x 14.2	12.8	○	○	0/0	○	○	○	3	1	24	●	610

[3] For more information about all products in this table, select product Info no. 909 or visit www.pcworld.com/productinfo.

[4] Includes ATI Expert LCD video adapter with 4MB of video memory.

[5] Automated after 5 p.m. PST and on weekends.

[6] Includes ATI Expert LCD video adapter with 8MB of video memory.

good, but Princeton's DPP560 outperformed them with uniform, bright-white backgrounds and crisp, dense letters in various sizes that are easy on the eyes.

ViewSonic's VPA150 earned a Very good text score, but it stumbled on our spreadsheet test; though text was clearly legible, the grid lines between cells faded to gray, and we saw jagged pixels at small font sizes. On Apple's Studio Display, letters larger than 8 points appeared a bit smudged (though they were still acceptably clear). Judges handed Compaq's TFT 5000 low marks for a variety of ills, including below-average legibility, out-of-focus screen areas, and jitter.

COLOR ME LCD

TEXT IS ONLY half of the picture, though. Graphics and color—from subtle shades to pastels and bright hues—are especially important for presentations and viewing graphics-intensive Web pages.

Princeton's DPP560 took top honors again. Judges described its rendering of a

To LCD or Not to LCD: Two Views on Flat Panels

WRITERS AND DESIGNERS place different demands on a computer's display. So we asked Carla Thornton, a writer and contributing editor at *PC World*, and Alan Davenport, a Web-site and corporate publications designer, about the pros and cons of using LCDs.

Carla Thornton uses a 15-inch ViewSonic VPA150, the fifth-place 15-inch LCD monitor, mostly for writing and surfing the Net.

PC World: How does your LCD compare to your old CRT?

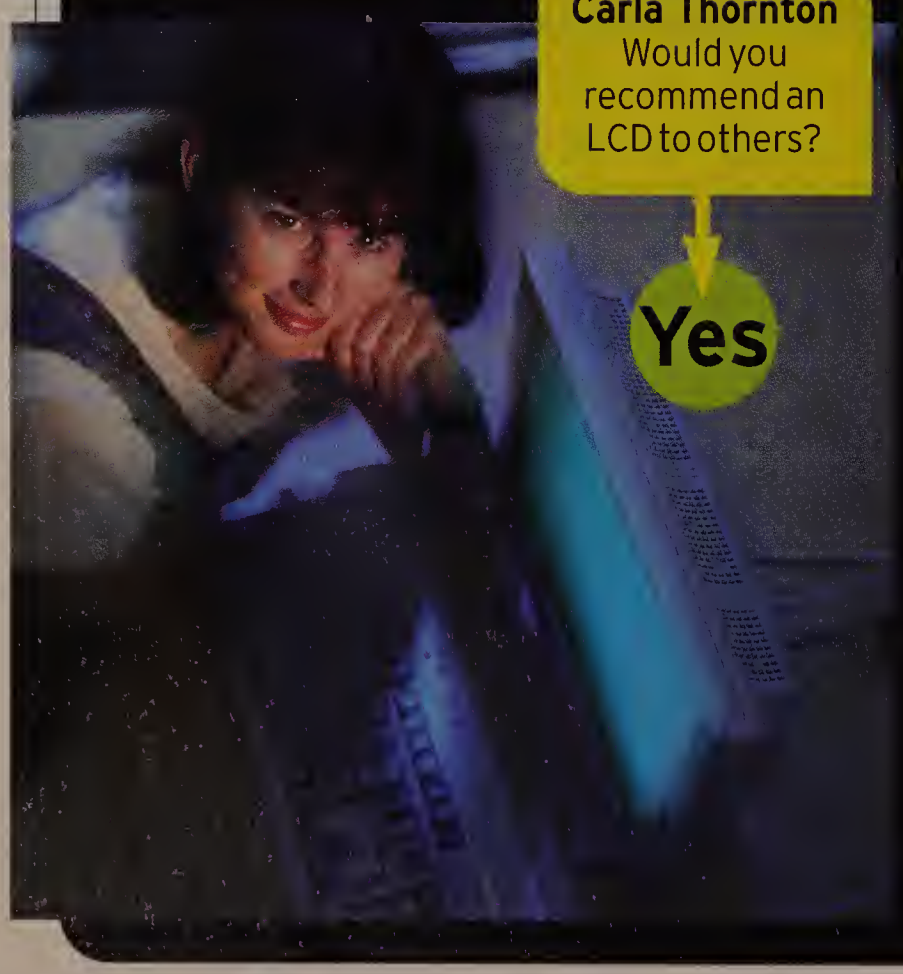
Thornton: I like the LCD primarily because of the thin footprint. It's so much lighter than a CRT monitor, and I don't have this giant thing on my desk anymore.

PCW: Is image quality better on the LCD?

Thornton: I didn't see a big improvement with text or graphics. I tweaked the settings, and it seems as good to me now as the CRT when I look at it head-on. It's definitely different with viewing angles, though. Whenever I stand up or look at the monitor from the side, it's a little disconcerting that the image looks hazy, kind of like a dual-scan notebook display. I miss the kind of solid image quality that CRTs seem to have.

PCW: Is your LCD worth the price?

Thornton: Yes, but if you can, wait until the prices come down to less than $1000.



Designer **Alan Davenport** tested a 15-inch Mitsubishi LCD51 (a model that fell short of our Top 10). He used it to proofread designs and layouts.

PCW: What did you think of the LCD's image quality?

Davenport: I've seen images jitter or wave as if the panel's surface were made of water. I've also noticed ghosting—a faint colored outline of shapes sometimes appeared on the screen. The Mitsubishi is fine for doing proofing, but it's unlikely I'd ever use this size LCD for designing.

PCW: How did it compare to your notebook LCD screen?

Davenport: This LCD is brighter than my notebook screen. I was impressed with that. And I haven't had problems with natural light interfering with the image, as I do with the notebook.

PCW: Have the limited viewing angles frustrated you?

Davenport: You do have to stand in a certain location, basically in front of the LCD, to see the image clearly. It hasn't been a big problem, but I can see how it might be.

PCW: Has eyestrain been an issue?

Davenport: Yes. I noticed the fuzzy type the first time I turned it on. You get used to it—it's like your brain is compensating for the fuzzy type. But the overall text quality isn't as good as a CRT's.

PHOTOGRAPHS: ROBERT HOUSER

color photo of Olympic sprinters as "positively lifelike." Folds in the runners' clothes were rendered in great detail, as were tiny beads of perspiration on an athlete's forehead. Honorable mentions go to Acer's AcerView F51 and ViewSonic's VPD150. Both handled a photo of juicy fresh fruit with gusto.

Others paled in comparison. Among our Top 10, Mag InnoVision's LT541C comes with USB ports and a screen-pivot feature, but its colors looked dull. Compaq's TFT 5000 did no better with graphics than with text, making our fruit look bland and somewhat less than fresh.

IT'S A FLAT WORLD AFTER ALL (left to right): the ViewSonic VPA150, Apple Studio Display, and AcerView F51 in landscape mode, and the ViewSonic VPD150 pivoted into portrait mode.

RESTRICTED VIEWING

CRT SCREENS WORK fine within a range of resolution settings, but LCDs don't. All the LCDs we tested display best at a standard resolution of 1024 by 768. While you can display at lower resolutions, and in some cases higher, image quality can vary widely. Graphics professionals and CAD specialists who need the pinpoint accuracy of higher resolutions won't find 15-inch LCDs very useful for designing (see "To LCD or Not to LCD," page 182).

LCDs' limited viewing angles might also bother some users. When looking at a CRT from the side or top, you can still read text and see detail in a color image. In contrast, most LCDs look dark and faded from sharp angles. We did see some exceptions: Text was legible from side angles on Apple's Studio Display (thanks to a film coating feature) and on AcerView's F51 and LG's 500LC, although less clear than on CRTs.

THE PRICE OF GETTING SKINNY

Best Price: Mag InnoVision LT541C

Worst Price: NEC MultiSync 1510

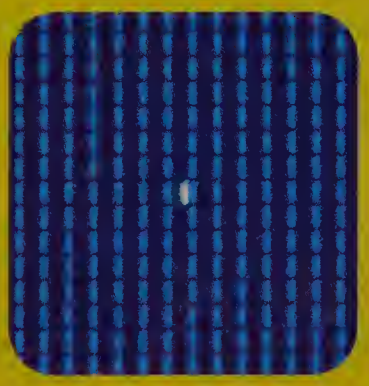
PRICES FOR 15-INCH LCDs dipped to a record low earlier this year, but have since been creeping up due to a shortage of ▶

Pixel Imperfect — See White Spots? One Word of Advice: Complain!

THAT TINY BRIGHT SPOT on your LCD screen may look like a shining star, but there's nothing heavenly about a burned-out pixel. For LCD owners, dead pixels can become a Big Dipper of a headache.

With as many as 2.4 million pixels on each 15-inch LCD screen, it's no surprise that some of them die—sometimes before you open the box. Of the 19 displays we reviewed, 2 had noticeable dead pixels.

But when you shell out a grand or more for an LCD, you expect perfection, right? Problem is, returning a display because of dead pixels can be a hassle, or even impossible, depending on the vendor's policy—which may be vague about dead-pixel details.



OUT, OUT DAMNED SPOT: A dead pixel (center) can mar an otherwise fine picture.

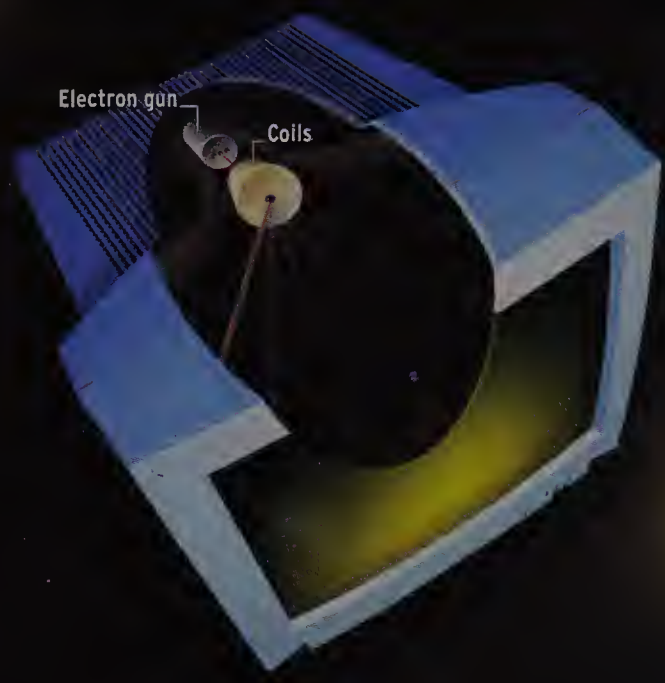
Apple Computer, for instance, wouldn't quantify the specifics of its dead-pixel policy. A representative would say only that Apple is committed to customer satisfaction. For Acer, a panel must have three dead pixels within a space about the size of a quarter to be returnable.

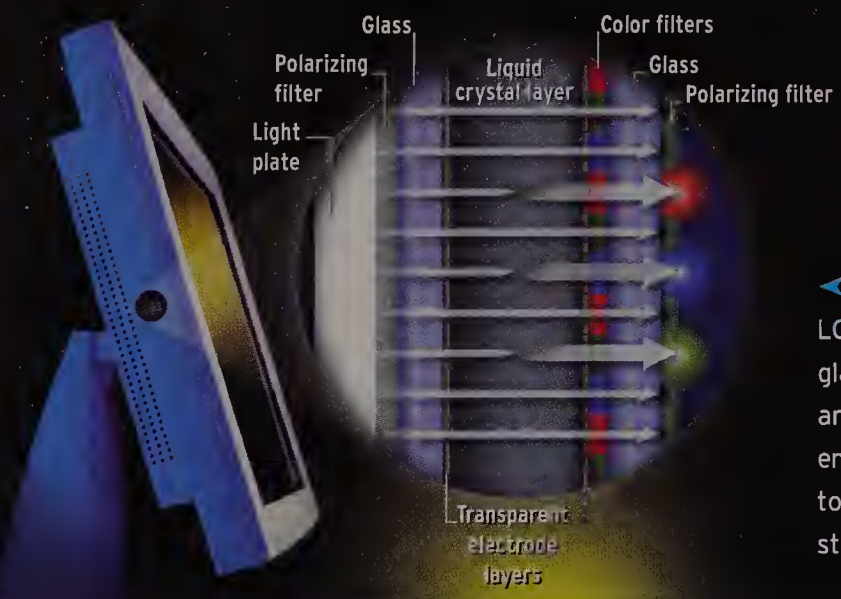
Philips, whose 151AX narrowly missed our chart, seems to be more flexible. "LCDs are inherently susceptible to bad pixels, but with advances in manufacturing, most panels today have no noticeable defects," says Michael Cusick, the company's director of marketing. "While there are acceptable limits in the specifications, we wouldn't want to put a number on what is acceptable to the user. A lot depends on what applications are running. If the monitor is within specification yet the user finds it objectionable, Philips will do its best to find a solution that will satisfy the customer." In other words, there's no clear-cut answer.

Before you buy an LCD, make sure you can live with the maker's dead-pixel policy. When you get the LCD, run different programs and look closely at the screen. If there's a little white dot that bothers you, ask the vendor for a replacement. If the company balks, complain 'til you're out of breath. Then complain some more. "It's not something we want to advertise," one vendor told us, "but if they complain loud enough, we'll replace the panel."

Why Are CRTs Fat and LCDs Skinny?

➤ INSIDE A CRT MONITOR, a gun fires electrons at a screen to make colored phosphor dots glow. Heavy electromagnetic coils deflect the electrons to aim them, sweeping a "scan" line from left to right, then sweeping another line just below that one, and so on until the entire screen is painted. The closer the gun is to the screen, the harder it is to accurately aim the electrons and make a crisp image.





➤ AN LCD DOESN'T INVOLVE a gun shooting at a target. Instead, an LCD is structured like a sandwich, with a liquid between two sheets of glass, all atop a glowing plate. Thousands of transparent electrodes, arranged like the squares on graph paper, separately control the orientation of nearby molecules of the liquid, allowing or preventing light to pass through the polarized top sheet. The snugly fit, flat construction allows for the slim, sleek design of an LCD monitor.

panel glass. According to San Jose, California–based Stanford Research, the current average street price for a 15-inch LCD is about $1100. Prices are expected to rise gradually until the end of the year.

At $1599, NEC's MultiSync 1510 was our most expensive review unit; it includes features such as hard protective glass and a technology called XtraView that widens the screen's viewing area. But we were disappointed to find only so-so image quality on such an expensive LCD. Apple's relatively pricey Studio Display sweetens the pot with its lively style, a wide swivel, and a feature that lets you raise the panel up a full 6 inches. The $1085 Princeton DPP560, our top Best Buy, shows that you don't have to pay top dollar to get excellent screen quality and a graceful design.

What do you sacrifice by opting for a sub-$1000 model like the $949 Mag InnoVision LT541C, the least expensive LCD in our Top 10? Mostly screen quality and design—the relatively bulky monitor offers lackluster graphics. For only $50 more, the Dell 1500FP gives you much better screen quality, though you do give up features like USB ports.

Face-Off: LCD Versus CRT

	15-inch LCD	17-inch CRT
Average street price	$1100	$450
Average viewable screen area	15 inches	15.8 inches
Viewing angles	Limited range	Wide range
Screen problems[1]	Flicker-free, prone to jitter	Jitter-free, prone to moiré
Resolution	Works best in 1024 by 768	Can work in multiple settings
Design style	Thin	Bulky
Average dimensions (w/d/h, inches)	15 x 8 x 16	16 x 17 x 17
Average weight	12 pounds	40 pounds
Average power usage	35 watts	110 watts

[1] Jitter looks like wavy lines, moiré like ripples.

SEXY SCREENS, SEVERAL SIZES

Best Design: Apple Studio Display
Worst Design: Mag InnoVision LT530C, LT541C

LCDS ARE the closest thing the computer industry has to a sexy product. Molded from the translucent blue plastic of the first iMacs, Apple's Studio Display would surely be the talk of the office. The Samsung SyncMaster 530TFT has a shimmering silver-gray case, and looks stately poised on its base.

But all LCD monitors have design benefits over CRTs. IBM's P72, a Best Buy 17-inch CRT on this month's *Top 10 Monitors* chart (see page 247), weighs 43 pounds and is 17 inches deep. Compare that to the Princeton DPP560's 12.1 pounds and 8-inch depth, and you'll understand why an increasing num- ▶

INFOGRAPHIC: JEFF BERLIN

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ber of users are willing to shell out the premium for an LCD monitor.

Still, some LCDs could stand to lose a few inches. The two nearly foot-deep Mag InnoVision models take up the most space of any units on the chart; both of the monitors feature a grooved base that doubles as a tray that can hold pencils and paper clips. ViewSonic, on the other hand, makes very shallow LCDs, measuring a mere 6.7 inches from front to back.

The best-designed LCDs tilt, swivel, and pivot. All of our panels tilt up and down, and several units swivel side to side for more control over the viewing angle. The top three monitors on the chart, along with three others, pivot 90 degrees for viewing documents in portrait mode, a plus for viewing Web pages and working with letters and legal-size documents.

A few monitors come equipped with integrated speakers, a nice feature if you want to add some sound and fury to your presentations. Both ViewSonic and Samsung fix speakers into the LCD's base. The Samsung delivered the fuller sound of the two, about the same quality as a standard multimedia CRT.

SCREEN CONTROLS: STUDY IN CONTRASTS

Best Controls: Samsung SyncMaster 530TFT

Worst Controls: None

LCDs, LIKE CRTs, need periodic adjustments. In addition to brightness, contrast, and vertical and horizontal controls, analog LCDs have a phase adjustment button to quell the occasional case of the jitters. Samsung's SyncMaster 530TFT has the most complete set of controls of the analog monitors, including external audio controls that are easy to adjust.

Flat-panels' controls, however, can be just as clunky as those on CRTs. Some, such as the Compaq TFT 5000, use abbreviations that are difficult to decipher, so the controls take some time to master.

Even the most cryptic menu can be decoded if you have it on the screen long enough. The display time of the Dell 1500FP's menu, helpfully, can be increased from its default of 10 seconds up to a leisurely 25 seconds.

The location of exterior control buttons can also make a monitor more difficult to adjust. Mag InnoVision's digital LT530C, for instance, has contrast and brightness controls, but they're located beyond easy reach, on the panel's top bezel. Apple tucks several controls under the panel's bottom edge, which makes for some unnecessary hunting. The power switches on the ViewSonic and Princeton models are hidden on the backs of the monitors.

A good service policy from a reputable manufacturer is the best protection against unforeseen problems, including dead pixels.

PROTECT YOUR INVESTMENT

Best Support: Samsung SyncMaster 530TFT, ViewSonic VPA-150 and VPD150

Worst Support: Apple Studio Display

LCDs HAVEN'T been around long enough to yield a verdict on their reliability. The typical life span of the display's backlight, for instance, has yet to be determined; estimates vary from three to six years. "This time next year we should have really good service data, like what's the DOA rate [of the backlight], and in what way are units failing," says Michael Cusick, director of marketing at Philips Electronics.

A good service policy from a reputable manufacturer is the best protection against unforeseen problems, including dead pixels (see "Pixel Imperfect," page 183). Our top five chart makers offer the best warranty and support policies. In contrast, Apple backs its LCD with a one-year warranty and only 12 hours of weekday technical support.

TOUCH UP YOUR DESK

THE PRICES OF LCD monitors will have to drop further before they become a common sight at the office. But if desk clutter bogs you down, your purse strings aren't too tight, and you wouldn't mind starting your day with a touch of millennial pizzazz on your desk, consider replacing your hulking CRT with a stylish LCD.

ALL THE PRETTY PANELS IN A ROW: Two relatively bulky Mag InnoVision LCDs, the LT530C (leftmost) and the LT541C, bookend the svelte LG 500LC (second from left) and Dell 1500FP.

For reviews of LCDs that missed the Top 10, see PC World Online at www.pcworld.com/aug99/lcd_monitors. Rick Overton is a freelance writer living in Northern California. ■

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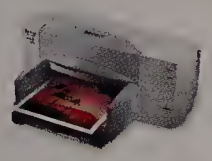

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- 1-Year NBD On-site[3] Service

$1979

Business Lease[15]: $66/Mo., 36 Mos.

E•VALUE CODE: 03654-590719

DELL DIMENSION XPS T450

High Performance, High Value

- Pentium III Processor at 450MHz
- Mini-Tower Model
- 64MB 100MHz SDRAM
- 6.4GB[4] Ultra ATA Hard Drive
- 17" (16.0" vis, .26dp) M780 Monitor
- 8MB ATI XPERT 98D 3D AGP Graphics Card
- 40X Max[5] Variable CD-ROM Drive
- Yamaha XG 64V Wavetable Sound
- MS Office 2000 Small Business plus Bookshelf 2000; McAfee VirusScan
- MS Windows 98 Second Edition
- MS IntelliMouse
- 3-Year Limited Warranty[2]
- 1-Year NBD On-site[3] Service

★ *Upgrade to 128MB 100MHz SDRAM, add $109.*

★ *3Com 3C905C-TXM 10/100 NIC, add $39.*

$1299

Business Lease[15]: $44/Mo., 36 Mos.

E•VALUE CODE: 03654-590712

DELL DIMENSION V400c

Value-Optimized Desktop

- Intel Celeron Processor at 400MHz
- Mini-Tower Model
- 32MB SDRAM
- 4.3GB[4] Ultra ATA Hard Drive
- 15" (13.8" vis) 800F Monitor
- 8MB ATI 3D AGP Graphics Card
- 40X Max[5] Variable CD-ROM Drive
- Intel 10/100 Ethernet Controller
- Microsoft® Works Suite 99 with Money 99 Basic; McAfee VirusScan
- MS Windows 98 Second Edition
- Logitech FirstMouse+ Wheel (PS/2v)
- 3-Year Limited Warranty[2]
- 1-Year NBD On-site[3] Service

★ *Upgrade to 64MB SDRAM, add $49.*

★ *Upgrade to a 6.4GB[4] Ultra ATA Hard Drive, add $19.*

$899

Business Lease[15]: $30/Mo., 36 Mos.

E•VALUE CODE: 03654-590708

DELL AWARD INFO

- In 1998, Dell desktops and workstations won more than 140 product and service awards. See www.dell.com/awards98 for details. Or browse by product:

www.dell.com/products/workstat/awards.htm
www.dell.com/products/optiplex/awards.htm
www.dell.com/products/dim/awards.htm

Advertised configurations vary from award-winning configurations.

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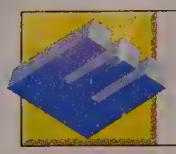
- **In Mexico,[1] call 01-800-021-4531**



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No matter what you want to do or where you want to go, Dell's got a notebook you'll want along for the ride.

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To get the notebook that's just right for you, visit www.dell.com or call **800-545-7131**.

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The Dell Latitude Notebook Series. The network-optimized notebook.

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DELL INSPIRON™ 7000

Desktop Features, Notebook Convenience

- Pentium® II Processor at 400MHz
- 15" XGA Active Matrix Display
- 96MB SDRAM
- 14GB[4] Ultra ATA Hard Drive
- Removable Combo 4X[10] DVD-ROM and Floppy Drive
- 2X AGP 8MB ATI RAGE™ LT Pro 3D Video
- 3D Surround Sound with Wavetable
- Lithium Ion Battery
- 56K Capable[11] Gold Card Global Modem with Trial Offer ConnectDirect℠ Internet Access[14]
- Microsoft® Office 2000 Small Business; McAfee VirusScan
- MS® Windows® 98 Second Edition
- Custom Leather Case
- 3-Year Limited Warranty[2]

$3579

Business Lease[15]: $120/Mo., 36 Mos.

E•VALUE CODE: 03655-890735

NEW DELL INSPIRON 7000

Desktop Features, Notebook Convenience

- Intel® Celeron™ Processor at 366MHz
- 15" XGA Active Matrix Display
- 32MB SDRAM
- 4.8GB[4] Ultra ATA Hard Drive
- Removable Combo 24X Max[7] Variable CD-ROM and Floppy Drive
- 2X AGP 4MB ATI RAGE LT Pro 3D Video
- 3D Surround Sound with Wavetable
- Lithium Ion Battery
- Microsoft Works Suite 99 with Money 99 Basic; McAfee VirusScan
- MS Windows 98 Second Edition
- 3-Year Limited Warranty[2]

★ *Upgrade to 64MB SDRAM, add $99.*

$1999

Business Lease[15]: $67/Mo., 36 Mos.

E•VALUE CODE: 03655-890719

DELL INSPIRON 3500

Light Weight, Light Price

- Pentium II Processor at 366MHz
- 14.1" XGA Active Matrix Display
- 64MB SDRAM
- 4.8GB[4] Ultra ATA Hard Drive
- Modular 24X Max[7] Variable CD-ROM and Floppy Drive
- NeoMagic® MediaMagic™ 256AV AGP Video
- 3D Surround Sound with Wavetable
- Lithium Ion Battery
- Internal 56K Capable[11] v.90 Fax Modem with Trial Offer ConnectDirect Internet Access[14]
- Microsoft Office 2000 Small Business; McAfee VirusScan
- MS Windows 98 Second Edition
- Deluxe Nylon Case
- 3-Year Limited Warranty[2]

$2399

Business Lease[15]: $80/Mo., 36 Mos.

E•VALUE CODE: 03655-890723

NEW DELL INSPIRON 3500

Light Weight, Light Price

- Intel Celeron Processor at 366MHz
- 14.1" XGA Active Matrix Display
- 32MB SDRAM
- 4.8GB[4] Ultra ATA Hard Drive
- Modular 24X Max[7] Variable CD-ROM and Floppy Drive
- NeoMagic MediaMagic 256AV AGP Video
- 3D Surround Sound with Wavetable
- Lithium Ion Battery
- Microsoft Works Suite 99 with Money 99 Basic; McAfee VirusScan
- MS Windows 98 Second Edition
- 3-Year Limited Warranty[2]

★ *Upgrade to 64MB SDRAM, add $99.*

★ *Deluxe Nylon Case, add $39.*

★ *3-Year NBD On-site[3] Service, add $99.*

$1799

Business Lease[15]: $60/Mo., 36 Mos.

E•VALUE CODE: 03655-890717

NEW DELL LATITUDE® CPi R

Network-Optimized Notebook

- Pentium II Processor at 400MHz
- 14.1" XGA Active Matrix Display
- 96MB SDRAM (512MB Max[13])
- 4.8GB[4] Ultra ATA Hard Drive
- Modular 24X Max[7] Variable CD-ROM
- Modular Floppy Drive
- MagicMedia™ 256ZX
- 3D Surround Sound with Wavetable
- Lithium Ion Battery with 1-Hour ExpressCharge™ Technology
- Microsoft Windows NT Workstation 4.0/Touchpad
- 3-Year Next-Business-Day On-site[3] Service

★ *Upgrade to 128MB SDRAM, add $99.*

$3199

Business Lease[15]: $107/Mo., 36 Mos.

E•VALUE CODE: 03655-790731

NEW DELL LATITUDE CPt

Network-Optimized Notebook

- Intel Celeron Processor at 333MHz
- 14.1" XGA Active Matrix Display
- 64MB SDRAM (512MB Max[13])
- 4.8GB[4] Ultra ATA Hard Drive
- Modular 24X Max[7] Variable CD-ROM
- Modular Floppy Drive
- MagicMedia 256ZX
- 3D Surround Sound with Wavetable
- Lithium Ion Battery with 1-Hour ExpressCharge Technology
- Microsoft Windows NT Workstation 4.0/Touchpad
- 1-Year Next-Business-Day On-site[3] Service

★ *Upgrade to 96MB SDRAM, add $99.*

$1899

Business Lease[15]: $64/Mo., 36 Mos.

E•VALUE CODE: 03655-790718

DELL NOTEBOOK AWARD INFORMATION

- Inspiron 3500 C300XT – *PC World*'s Best Buy in the budget category, 6/99, 7/99.
- Latitude CPi A366XT – *PC World*'s #1 Best Buy Power Notebook, 6/99.
- Latitude CPi Series A366XT– May *Windows Magazine* List Fastest Performance, 5/99.
- Inspiron 7000 A366LT – *PC World*'s Top 10 Power Notebooks, 4/99.
- Latitude CPi Series 366XT – 5-Time Survivor of *PC Computing*'s Annual Torture Test, 3/99.
- Latitude CPi Series D300XT – *PC Computing*'s #1 Best Buy Power Notebook, 3/99.
- Inspiron 7000 A366LT – *PC Magazine*'s Editors' Choice for small businesses, 2/99.

Advertised configurations vary from award-winning configurations.

Gigabuys™ for Notebooks

Available at Dell.com. More products at great prices!

- *NEW* 100MB Zip Internal Drive for Latitude CP & CPi (Win95/98), add $199.
- Notebook Conversion Package, including Black ViewSonic 17" (16.0" viewable) Multimedia Monitor, ErgoMouse and Keyboard, add $429.
- HP® DeskJet® 882 Color Printer, add $299.
- Canon BJC-50 Portable Printer, add $349.
- Infocus LP 400 Ultra Portable Projector, add $3025.
- Targus Defcon Security Device, add $49.
- Auto/Air Power Adapter, add $99.

intel inside
pentium® II processor

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For companies just starting a network, the PowerEdge 1300 is scalable up to 108GB of internal storage capacity. Best of all, it's true server architecture at a price you might expect to pay for a desktop. The PowerEdge 2300 is scalable up to 144GB of internal storage capacity (with 108GB in optional hot-swap drives). The 2300 is also scalable up to 2GB of SDRAM, making it ideal for growing businesses with workgroups. And for companies that can't afford downtime, Dell offers the PowerEdge 4300 and 6300, with hot-swap cooling fans and redundant power supplies for added availability. And you can be assured that every server comes with our award-winning service and support.

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pentium® III

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DELL® POWEREDGE® 6300 SERVER
(QUAD PROCESSOR CAPABLE)

Enterprise Class Server

- **Pentium® III Xeon™ Processor at 500MHz**
- 512MB ECC EDO RAM
- Three 9GB[4] (10,000 RPM) Ultra-2/LVD SCSI Hot-Swap Hard Drives
- Ultra-2/LVD PowerEdge Expandable RAID Controller 2 with 128MB ECC Cache
- HP® OpenView™ NNM Special Edition
- Two Intel® Pro/100+ PCI Ethernet Adapters with Adaptive Fault Tolerance Software
- Integrated Dual Ultra-2/LVD and Ultra/Narrow SCSI Controllers
- **Redundant Hot-Swap Power Supplies, Cooling Fans and Processor Fans**
- 7 Expansion Slots: (4) 64-bit, (3) 32-bit PCI
- 8-1" Hard Drive Bays/4-5.25" Media Bays
- 3-Year NBD On-site[3] Service
- 1-Year DirectLine℠ NOS Support
- 7x24 Dedicated Server Hardware Telephone and Online Technical Support

$12,749

Business Lease[15]: $420/Mo., 36 Mos.

E•VALUE CODE: 03656-290701

DELL POWEREDGE 4300 SERVER
(DUAL PROCESSOR/RAID CAPABLE)

Departmental Server

- **Pentium III Processor at 500MHz**
- 256MB 100MHz ECC SDRAM
- 9GB[4] Ultra-2/LVD SCSI Hard Drive (Hot-Swap Optional)
- HP OpenView NNM Special Edition
- Two Intel Pro/100+ PCI Ethernet Adapters with Adaptive Fault Tolerance Software
- Integrated Ultra-2/LVD and Ultra/Narrow SCSI Controllers
- **Redundant Hot-Swap Power Supplies, Cooling Fans and Processor Fans**
- 6 Expansion Slots: 4 PCI, 2 PCI/ISA
- 6-1.6" Hard Drive Bays/4-5.25" Media Bays
- 3-Year NBD On-site[3] Service
- 1-Year DirectLine NOS Support
- 7x24 Dedicated Server Hardware Telephone and Online Technical Support

★ *PowerVault™ 100T 12/24GB Variable SCSI DAT Tape Backup Unit, add $749.*

$5399

Business Lease[15]: $181/Mo., 36 Mos.

E•VALUE CODE: 03656-290753

DELL POWEREDGE 2300 SERVER
(RAID 5 CONFIGURATION)

Workgroup Server

- **Pentium III Processor at 500MHz**
- 128MB 100MHz ECC SDRAM
- Three 4GB[4] Ultra-2/LVD SCSI Hot-Swap Hard Drives
- **Ultra-2/LVD PowerEdge Expandable RAID Controller 2/Single-Channel**
- HP OpenView NNM Special Edition
- Intel Pro/100+ PCI Ethernet Adapter
- Integrated Ultra-2/LVD and Ultra/Narrow SCSI Controllers
- 6 Expansion Slots: 4 PCI, 2 PCI/ISA
- Hard Drive Bays: 6-1"
- 4 Media Bays: 3-5.25", 1-3.5"
- 3-Year NBD On-site[3] Service
- 7x24 Dedicated Server Hardware Telephone and Online Technical Support

★ *APC Smart-UPS 700W Power Supply, add $369.*

$4399

Business Lease[15]: $147/Mo., 36 Mos.

E•VALUE CODE: 03656-290743

Gigabuys™

- 3Com® OfficeConnect™ Dual Speed Hub 8-port 10/100 TP, add $239.
- Cisco 1604 Ethernet ISDN Router with NT-1, add $1502.
- 3Com OfficeConnect 8/TPO, add $74.
- 3Com Connect TP 800 8-port TP, add $164.
- 3Com Superstack II Dual Speed Hub 500, 12-port, add $674.
- HP JetDirect 300x External 10/100 Base TX Printer Server, add $245.
- 3Com Sportster 56K Capable[11] v.90 External Modem, add $149.
- Princeton 15" Black Monitor, add $229.
- HP LaserJet® 1100SE, add $399.
- 3Com OfficeConnect ISDN LAN Modem, add $406.

DELL POWEREDGE 2300 SERVER
(DUAL PROCESSOR/RAID CAPABLE)

Workgroup Server

- **Pentium III Processor at 450MHz**
- 64MB 100MHz ECC SDRAM
- 4GB[4] Ultra-2/LVD SCSI Hard Drive (Hot-Swap Optional)
- HP OpenView NNM Special Edition
- Intel Pro/100+ PCI Ethernet Adapter
- Integrated Ultra-2/LVD and Ultra/Narrow SCSI Controllers
- 6 Expansion Slots: 4 PCI, 2 PCI/ISA
- Hard Drive Bays: 4-1.6" or 6-1"
- 4 Media Bays: 3-5.25", 1-3.5"
- 3-Year NBD On-site[3] Service
- 7x24 Dedicated Server Hardware Telephone and Online Technical Support

★ *Microsoft® Windows NT® Server 4.0 (10 Client Access Licenses), add $799.*

★ *Upgrade to a Pentium III Processor at 500MHz, add $300.*

$2449

Business Lease[15]: $82/Mo., 36 Mos.

E•VALUE CODE: 03656-290724

DELL POWEREDGE 1300 SERVER
(DUAL PROCESSOR/RAID CAPABLE)

Entry-Level Server

- **Pentium II Processor at 400MHz**
- 64MB 100MHz ECC SDRAM
- 4GB[4] Ultra-2/LVD SCSI Hard Drive
- HP OpenView NNM Special Edition
- Intel Pro/100+ PCI Ethernet Adapter
- Integrated PCI Ultra-2/LVD SCSI Controllers
- 6 Expansion Slots: 5 PCI, 1 PCI/ISA
- 4 Hard Drive Bays: 2-1.6" and 2-1"
- Media Bays: 3-5.25"
- 3-Year NBD On-site[3] Service
- 7x24 Dedicated Server Hardware Telephone and Online Technical Support

★ *Microsoft Windows NT Server 4.0 (10 Client Access Licenses), add $799.*

★ *Upgrade to 128MB 100MHz ECC SDRAM, add $122.*

$1649

Business Lease[15]: $55/Mo., 36 Mos.

E•VALUE CODE: 03656-290716

INTRODUCING DELL NETWORKS℠ INSTALLATION SERVICES FOR YOUR NETWORKING NEEDS

With one phone call to Dell, you can now customize your small business network with the right systems and peripherals—and have it installed! Some of the services we offer include:

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- Desktop Installation
- Peripheral Installation
- Network Cabling Installation
- Internet Setup and Configuration

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Must purchase a PowerEdge server to be eligible for installation services.

DELL SERVER AWARD INFO

- *Network Computing's* "50 Best Products of the Year" – Dell PowerEdge 6300 (Enterprise Server), 5/99.
- *Network Magazine* "1999 Products of the Year" – Dell PowerEdge 2300 (Workgroup Server), 5/99.
- *Network World* "World Class Award"–Dell PowerEdge 2300, 6/98.
- *Computer Shopper* "Top 100" – Dell PowerEdge 2300, 11/98.
- *PC Computing's* "The 'A' List" – Dell PowerEdge 6300, 11/98.
- *LANTimes* "The Best of *LANTimes* Over $25,000"– Dell PowerEdge 6300, 9/98.

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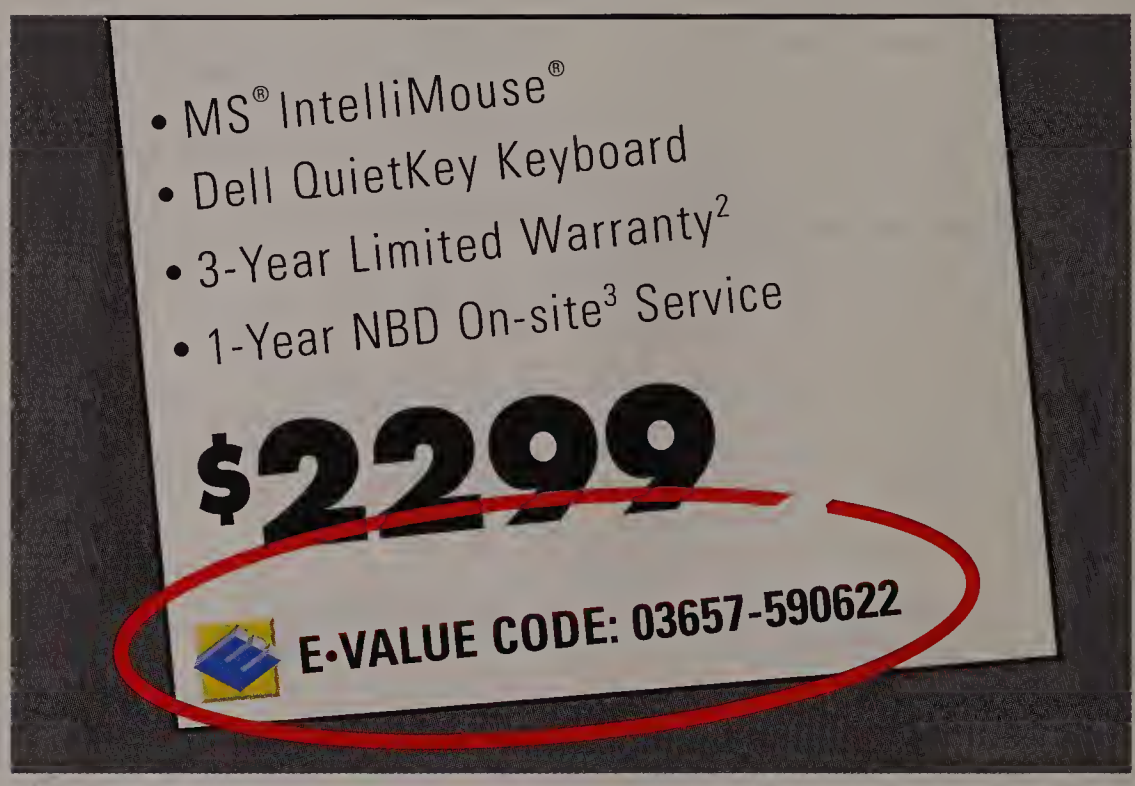

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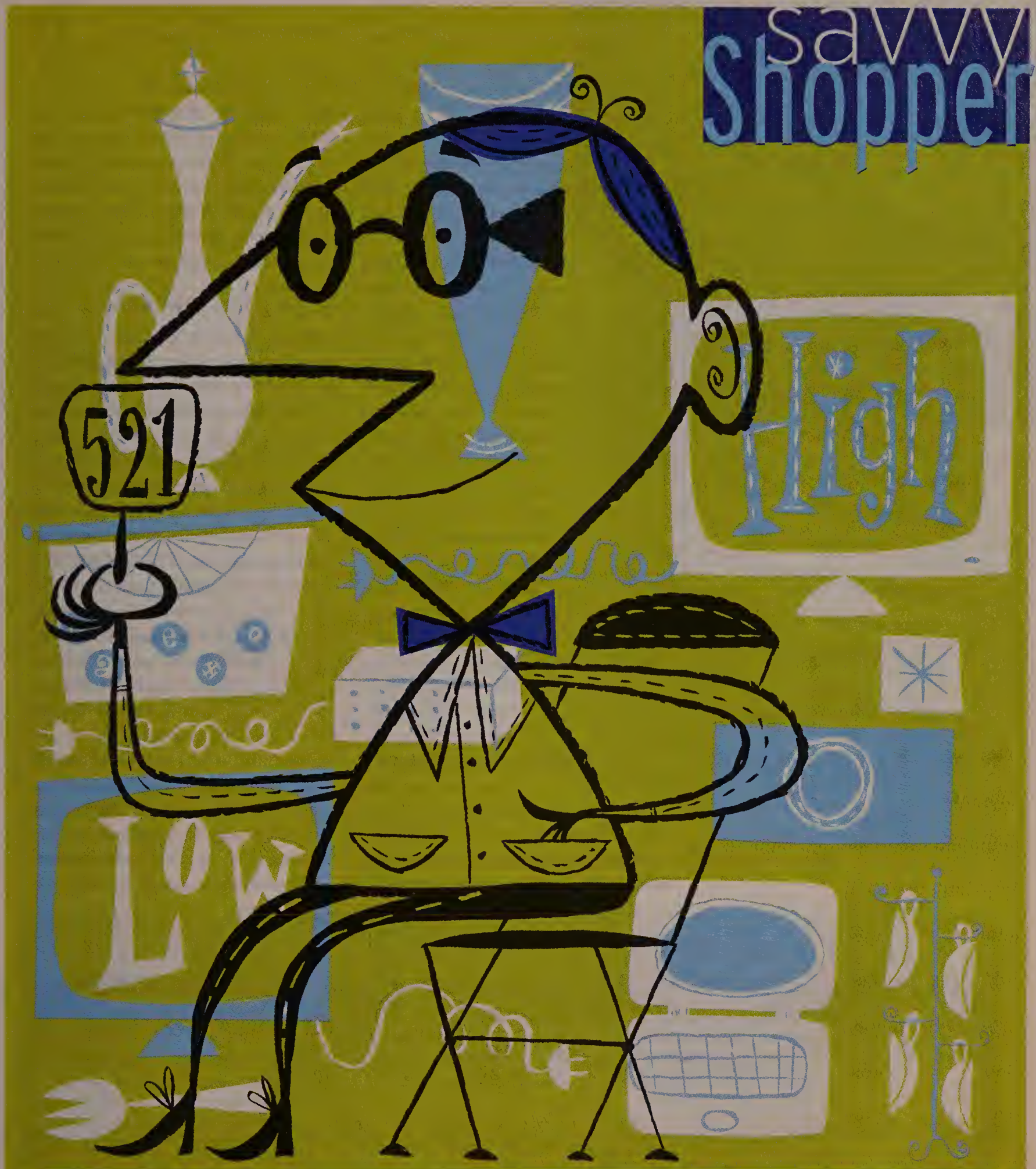

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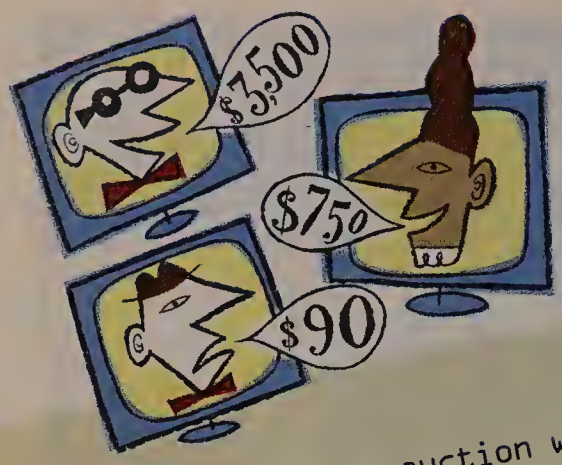
Use this invaluable guide to bidding smart before you put your money where your mouse is. ▶

BY GLENN McDONALD

ILLUSTRATIONS BY MELINDA BECK



Ten minutes before my auction was due to close, everything fell apart. I was about to score a sweetheart deal on a brand-new, in-the-box 3D graphics card—and my bid of $50 was just sitting there. Without warning, two other bidders swooped in and upped the price to $60. Panicking, I raised my bid to $65. No good. The price jumped to $70...$75...$80. When the dust settled, the card went to "BD from Richmond, Virginia" for $95. I cursed him under my breath. Then I surfed off to see what other cards were up for bid, and the hunt began anew...

—DIARY OF A WEB AUCTION BIDDER

WELCOME TO THE WILD world of online auctions. At its worst, the adventure can be hair-raising. But at its best, it can be an addictive way to buy high-quality products at bargain-basement prices. The range of items up for bid is nearly unlimited, from factory-fresh PC gear to toys like the ones Mom tossed out when you were a kid.

It's no wonder auctions rank among the hottest Web shopping sites. Even so, successful auction buying isn't a no-brainer. We speak as battle-hardened veterans of bidding at big-name sites (see "The Bidder Truth," below).

We began our quest with a wish list of 20 products, including a 333-MHz or better computer for less than $750, a $250 17-inch monitor, a $200 CD jukebox, an $80 golf club, and a $50 cordless telephone. Because collectibles today rank among the most popular of auction items, we also sought some special fare: a vintage copy of Stephen King's novel *The Stand,* a Mark McGwire rookie card, and a poster for *Star Wars: The Phantom Menace.*

Girded with credit cards, money orders, and determination, we went abidding. And we nabbed some real deals, including a Pentium II desktop PC with DVD-ROM for $770, and a notebook with a great active-matrix screen for $929. We snapped up the McGwire card for $120 and the Star Wars poster for $55. (We've seen these items selling elsewhere for $200 and $150, respectively.)

BIDS GONE BAD

WE DIDN'T, HOWEVER, come away from every auction we "won" feeling like winners. Some products were incomplete, and one never arrived at all. In addition, auctions don't come with all the standard assurances of retail buying: Return and warranty policies are often lacking.

On any given day, even the best sites may be awash in so-so deals. It all depends on what you're looking for. That makes the sites hard to rate, but two—EBay and Onsale—are standouts. Both have scads of items to choose from, well-designed interfaces that simplify buying, and plentiful help and tutorials. They're not the only auction sites worth a visit, but they're smart places to start.

No matter where you bid, arm yourself with thorough knowledge of the item you bid on, the seller offering it, and the rules of the game. Impulse bidders are begging to be disappointed—a fact we're embarrassed to admit we learned the hard way.

THE BIDDER TRUTH: EBay and Onsale Are the Real Deal

SITE	Auction type	Specialties of the house	What we liked	What needs work	Our take
Amazon.com Auctions auctions.amazon.com	Person-to-person	Collectibles, flea-market fare	Nice look and feel, friendly atmosphere, $250 insurance against fraud.	Fewer products than EBay and Yahoo Auctions.	A good start, but needs more items.
EBay* www.ebay.com	Person-to-person	Everything under the sun, and then some	Vast trove of goods, easy browsing and bidding, free insurance, great help section.	Not much, but person-to-person auctions can be risky.	No other person-to-person auction compares.
Egghead Auctions www.egghead.com	Merchant	Computer equipment	Decent—albeit slightly outdated—selection of PC hardware and software.	Clunky and confusing, no proxy bidding, so-so auction-tracking tools.	Not all it's cracked up to be.
First Auction www.firstauction.com	Merchant	Household goods, collectibles, jewelry	Best array of furniture, clothing, jewelry, food, and other noncomputer products.	No proxy bidding.	Like the Home Shopping Network, only online.
Onsale* www.onsale.com	Merchant	Computer and office equipment	Fine variety of items, efficient interface, extensive item tracking and help.	Proxy bidding could be easier.	Our favorite merchant auction.
UBid www.ubid.com	Merchant	Computer equipment	Wide range of computer products, handy auction-tracking page.	Uneven item descriptions, proxy bidding not universal.	Try Onsale first.
Yahoo Auctions auctions.yahoo.com	Person-to-person	Toys, collectibles, flea-market fare	Slick user interface, easy browsing, range of merchandise second only to EBay's.	Fewer fraud safeguards than EBay and Amazon.com Auctions.	A worthy EBay alternative.

* Recommended

1 Jumping Into the Auction

NEARLY ALL WEB AUCTION sites (and their number is rapidly expanding) fall into one of two categories: merchant or person-to-person. Merchant auctions, such as Egghead Auctions, First Auction, Onsale, and UBid, deal largely in manufacturers' overstock and refurbished items. Except for the bidding, the purchase process works much as it does at any other e-commerce site. The transaction is highly automated, you pay with a credit card over a secured line, and you can choose from a number of shipping options, including overnight delivery.

LAST YEAR'S MODEL

AT THEIR MOST lackluster, merchant auctions are technology graveyards—stuff winds up there because it can't easily be sold by traditional means. Some items are new but a tad outdated, others have been returned by their original buyers and spruced up for resale, and still others are just plain used. During our bidding spree, for example, Egghead Auctions offered Epson's original Stylus Photo printer, released in 1997, and UBid had last year's Stylus Photo 700—both refurbished. But no auction had the Epson printer we really coveted, the new-and-improved Stylus Photo 750.

In contrast to merchant auctions, person-to-person sites such as Amazon.com Auctions, EBay, and Yahoo Auctions simply act as venues to bring buyers and sellers together. Most sellers are individuals, though small businesses also hawk their wares. You'll find some new merchandise on these sites, but primarily they offer used items and collectibles—almost everything imaginable, really. (In the market for a Geiger counter? EBay had more than 30 of them when we checked.) Bidding is similar to the process on reseller sites, but you and the individual seller arrange the method of payment and delivery. The site takes a small cut of the seller's proceeds but isn't otherwise involved. (Buyers pay nothing to the site.)

As we've said, the product selection at every Web auction is in constant flux. But it's not completely unpredictable. Onsale, for instance, had a stellar selection of desktop computers each time we dropped in—around 120 models, including lots of brand-name equipment (from Acer, Hewlett-Packard, and IBM, for instance) and up-to-date technology (Pentium III chips). By contrast, First Auction stocked only 40 desktops, chiefly from obscure vendors like Gazelle and QualityClick (who?). On the other hand, First Auction came close to being a virtual department store—we ran across Weber grills, Body by Jake hip and thigh sculptors, fancy Mickey Mouse watches, leather love seats, electric pet-fences, and tins of gourmet popcorn (just the sort of fare that you would expect from the online arm of TV's Home Shopping Network).

Among the person-to-person sites, there was no competing with EBay's ridiculously vast offerings—nearly 2 million items in every conceivable category were up for auction when we visited. About a tenth as many auctions were under way at Yahoo—still a formidable selection. Amazon.com Auctions was brand-new when we shopped there, so choices were noticeably sparser. Given the site's inviting design and Amazon's millions of book-buying customers, we'd expect the selection to grow rapidly.

"Don't invest too much hope or emotion in any one item—there's no guarantee you'll get it for a price you're willing to pay."

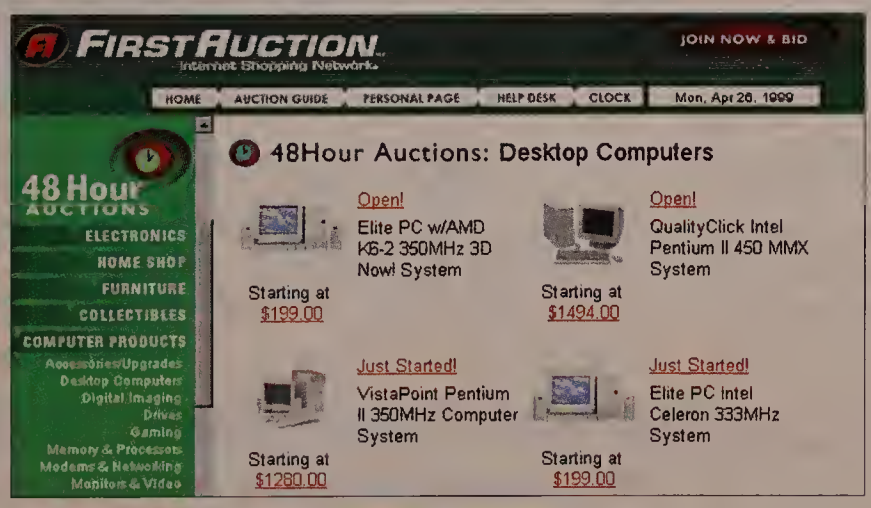
Kip Williams, Newport News, Virginia—bids on laser discs and vinyl records

online **Visit PC World Online for a guide to selling items at online auctions, plus a bidder's atlas of Web resources: www.pcworld.com/aug99/auctions.**

DOING YOUR BIDDING

ALL THE AUCTION SITES we visited let you window-shop without registering—a good way to compare sites before you start bidding. To track down an item you're looking for, you can browse by category, search by keyword, or check out the featured auctions hyped on the home page. In our experience, browsing by category was the most efficient way to go; the only item we found with a keyword was a copy of *The Stand* on EBay.

Web auctions typically last somewhere between an hour and a week, though some can last longer. The norm is four to five days for person-to- ▶



VISTA WHO? QUALITY WHAT? First Auction offers new PC systems, but big-name brands were few and far between when we shopped.

PHOTOGRAPH: KEITH LANPHER/LIASON AGENCY

GLAD We Bought It...

The purchase: Refurbished IBM Aptiva PC at UBid with 350-MHz PII CPU, 96MB of RAM, BGB hard drive, DVD-ROM drive.
The price: $770 including shipping.

The alternative: New Packard-Bell PC from Circuit City with same CPU, less RAM, smaller hard drive, and no DVD.
The price: $850 after rebate.

The upshot: It's not 100 percent new, and the 90-day warranty's short, but the Aptiva's still a lot of PC for the money.

SAD We Bought It...

The purchase: Refurbished 200-disc Kenwood CD changer at Onsale; holds 200 discs simultaneously.
The price: $210 including shipping.

The alternative: New Kenwood 200-disc changer at Crutchfield Online (www.crutchfield.com).
The price: $206 including shipping.

The upshot: We bid too much. The changer works fine, but who wouldn't opt for a new one for $4 less?

person auctions, two to three days for merchant sites. You can enter the fray at any point—in fact, bidding often proceeds rather sporadically until an auction's final minutes. But before you place a bid, take the following steps:

■ **Inspect the item.** Give the item listing a thorough going-over—including the fine print. What comes with the item and what doesn't? If the item is second-hand, is its condition clearly stated? Bear in mind that descriptions at person-to-person sites vary wildly—they're prepared by the individual sellers. If the description doesn't answer all your questions, phone or e-mail the seller before bidding.

Check the sales policies for the item. How much will shipping cost? Can you get your money back if the item isn't what you expected, or can you get it fixed under warranty? Don't be shocked to find your options are very limited: If merchant sites deign to take nondefective items back, they typically charge onerous restocking fees (First Auction charges 20 percent). Warranties on refurbished items often run for just 90 days, versus a year or more for new products. At person-to-person auctions, refund policies are entirely up to the seller, though pricey items often come with a money-back guarantee.

■ **Price the product.** You can't make an intelligent bid unless you know an item's fair market value. (Don't count on other bidders to display any common sense—folks often bid more than they'd pay for the same items at nonauction sites.) The quickest way to check a product's worth: Consult a price-comparison Web site like Excite's Product Finder (jango.excite.com), which monitors prices at various Web merchants, auctions, and online classifieds. Also helpful is Bidder's Edge (www.biddersedge.com), which tracks past selling prices at a number of auction sites.

■ **Read the rules.** You needn't be an auction expert to grasp the basics of the process: The seller puts an item up for bid and sets a minimum price; buyers can then place bids according to preset increments. For example, a digital camera may have a minimum opening bid of $199, with bid increments of $10. (Minimums are sometimes eye-poppingly tiny—"Pentium-III PCs starting at $7!"—but only when the seller is sure that bidding will quickly drive prices up to a profitable level.)

Not all rules are obvious to the uninitiated. At most merchant auctions, for instance, the closing times are changeable—if a last-minute bidding war erupts, the auction doesn't end until 5 minutes after the final bid has been placed. This delay can push the auction's conclusion past the stated closing time—and it may shut you out of the running if you can't stick around to monitor the action.

Rules get hairy in multiple-item sales. For example, 20 identical bread makers may be offered at a single auction. You can bid for one or more of the items. At EBay's multiple-item auctions, every winning bidder gets the item at the lowest successful bid. In other words, you may end up paying less than the amount you bid. Other sites don't follow this laudable policy—at Onsale, we got carried away, overbid, and paid $210 for a CD changer that other buyers got for $145.

■ **Study the seller.** If you're bidding at a person-to-person auction, one more rule applies. If you win, you will probably find yourself sending a check or money order to a distant stranger, so stick to sellers with a history of honest transactions. All major person-to-person sites rely on a peer review system to encourage fair dealing, an approach EBay pioneered with its Feedback Forum. Buyers and sellers post public comments indicating whether they've had a positive or negative experience with a seller; these comments are reflected in the seller's "feedback rating" number. The higher the number, the greater the evidence that you're dealing with someone trustworthy.

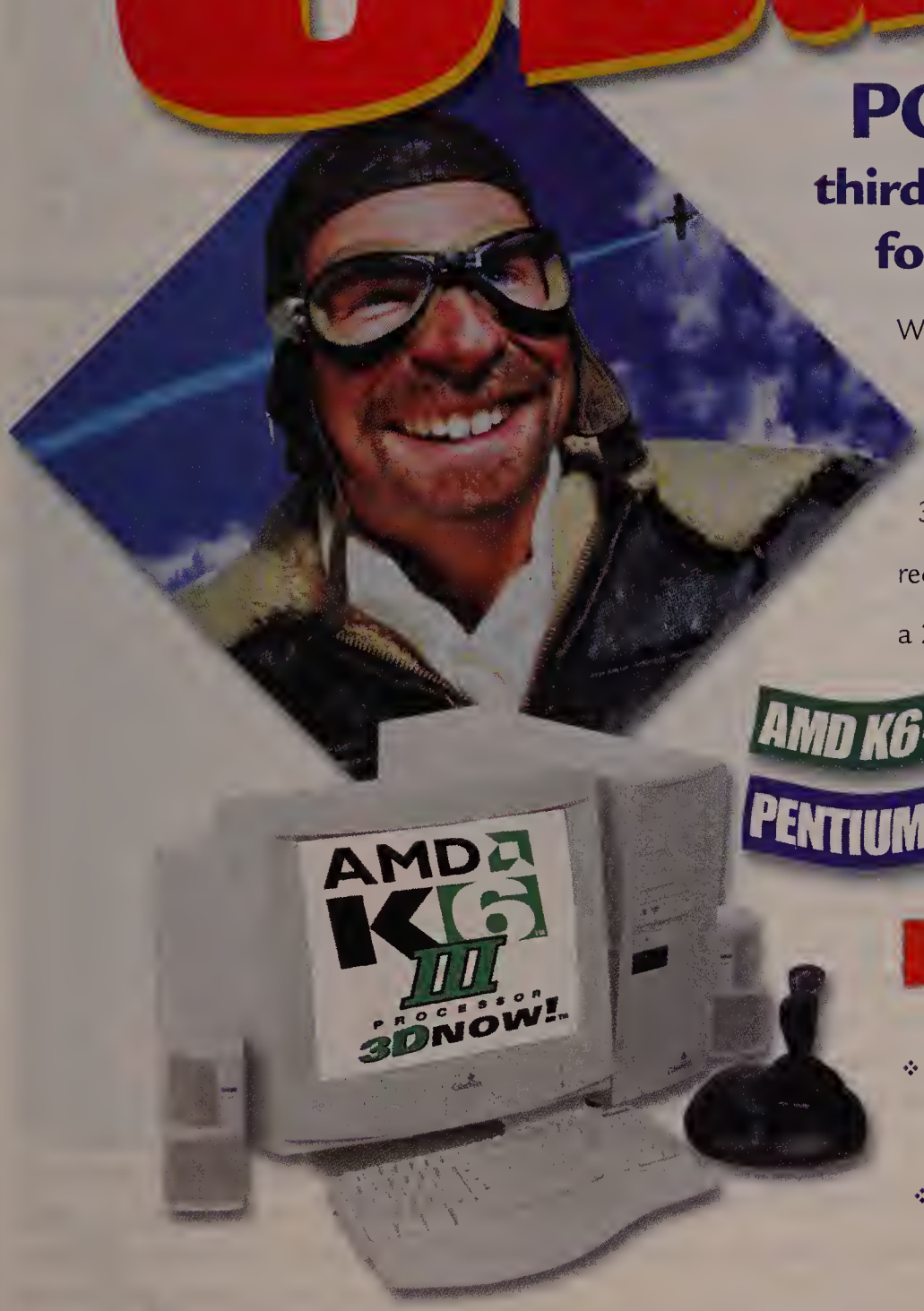
The Feedback Forum is invaluable, but it's not foolproof—sleazy merchants have been known to pad their profiles with infusions of false praise they've written themselves or paid others to supply. ▶

> "Don't even dream that being in a formal venue is safer than buying blind any other way. Approach online person-to-person sales as if it's the Wild West and somebody shot the sheriff."
>
> **Chita Jing, San Diego—bids on gemstones, tools, books, office supplies, and more**

PHOTOGRAPHS: KEVIN CANDLAND

CyberMax Presents

3Daredevils



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third-generation 3D technology for the thrill seeker in you!

With 3DNow!™ Technology, 3Daredevils fly at speeds of up to 450MHz and can easily handle the most demanding graphics with the new 3Dfx™ Voodoo3 3D accelerator. Of course, we recommend experiencing all this visual magic with a 21" monitor and goggles.

AMD K6-III/450 with 3DNow!	24.5 †
PENTIUM III-500	24.3

The Enthusiast 3Daredevil KIII-450

- ❖ AMD-K6®-III/450MHz w/3DNow!™ Technology
- ❖ 128MB SDRAM ❖ 13GB Ultra ATA Hard Drive
- ❖ nVIDIA™ RIVA TNT2 32MB 3D AGP Graphics w/ TV Out
- ❖ CyberMax 19"(.26dp-18"VA) Monitor
- ❖ 6x Max Variable DVD-ROM (32x Max Variable CD-ROM)
- ❖ V.90 Standard 56K Voice/Fax Modem w/ Speakerphone
- ❖ Aureal Vortex2 PCI Sound Card w/ A3D 2.0 Technology
- ❖ Altec Lansing ACS45.1Powercube Speakers w/ Subwoofer
- ❖ CorelWordPerfect Office 2000 Standard & Max's Enthusiast Pack (w/ Windows® 98)
- ❖ 3 Year Limited Warranty

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$1449

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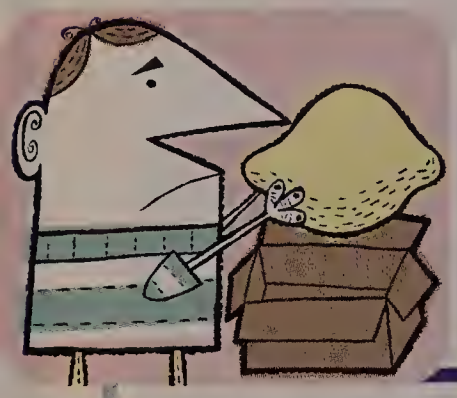
†Benchmark system configuration: STB Velocity 4400 16MB AGP (driver ver 1.42), WD AC31300 13GB IDE, AMD-K6-III processor based system: Biostar M5ALA mainboard /w 512KB off-chip cache. Pentium III processor based system: Biostar M6TBA mainboard. Windows 98: DirectX 6.1, FAT32, 128MB SDRAM

*Loan financing available on approved credit through independent lender. Payments based on 36-month term at an Annual Percentage Rate as low as 9.9%. Your APR may be higher.

Ultimately, all person-to-person auction transactions involve an element of risk (see "Bidder Beware," below).

FOXY PROXY BIDDING

BABY-SITTING A BID from beginning to end is not much fun and sometimes just impossible. So most auction services offer automated proxy bidding, usually under a cutesy name such as Bid-Buddy, Bid-Click, or BidButler. You specify the maximum you're willing to spend; the service then monitors the auction, placing bids for you that are just high enough to beat the current top bid. You drop out of the action only when bidding surpasses your maximum, whereupon the proxy service alerts you via e-mail, in case you want to reenter with a higher bid.



We found a CTX notebook at Onsale which we decided (after a bit of research) was worth $1000. We could have placed a standard bid for that amount, but what if other bidders' offers never climbed that high? Or we could start with a lowball bid and inch up as needed, but that approach would be tedious—and could fail if someone outbid us at the last moment, and we weren't online to react.

So we placed a proxy bid with a $1000 maximum and sat back. When the dust settled, we'd won the laptop for just $929, well under our budget. Pretty nifty. As far as we're concerned, proxy bidding should be the default option for all auctions. But only Yahoo Auctions and Amazon.com Auctions adopt it as the standard system on all auctions. EBay uses it for all auctions except multiple-item sales. Onsale offers proxy bidding for all auctions if ▶

PHOTOGRAPH: BRUCE BERMAN/LIASON AGENCY

Bidder Beware: Auction Scams and How to Avoid Them

CHARLOTTE CULVER'S BID on a computer at EBay wasn't enough to snare the system. But she thought she'd lucked into a deal anyway when the seller said he had an identical machine for sale. Culver rushed him a certified check for $775. Then the Midland, Texas, resident waited—and waited. "I never received anything from that seller," she laments, "except the runaround."

Sad to say, she's hardly alone: According to the National Consumer League's Internet Fraud Watch, auctions were the source of a sky-high 68 percent of complaints about online scams in 1998. Most cons occur at person-to-person sites, where bad-apple sellers may simply pocket unsuspecting bidders' money. Others sell products under false pretenses (think fake Rolexes, or "antiques" that aren't). Some sellers use multiple accounts or accomplices to drive up bids with artificial bidding—a process known as *shilling*.

Though most sellers at online auctions are reputable, no person-to-person auction site guarantees that you won't be rooked. Heed the following commonsense guidelines to protect yourself:

Suspicious? Don't bid. If a deal seems too good to be true or a seller smells fishy, pass on by. With millions of items up for bid, there's no reason for you to take unnecessary risks.

Know thy seller. At person-to-person sites, avoid sellers with poor or skimpy feedback. Don't buy from anyone who won't give you a physical address, and check where the seller's located. "It can be very hard to go after someone in another country," says Susan Grant of Internet Fraud Watch. "It's hard enough filing a small-claims case in another state."

CHARLOTTE CULVER (shown with a successful buy) knows the drill.

> "I never received anything from that seller, except the runaround."

Pay with plastic. Credit cards are safer than money orders or checks—you can dispute any charges with your credit card company. Or you can use an escrow service such as I-Escrow (www.iescrow.com). For a fee (typically 5 percent of the product's price), these services hold on to your payment until you've received and okayed the item.

Keep a paper trail. Retain copies of the item listing and all e-mail. You'll need them if you have to prove you got ripped off.

Report scams to the site. At the very least, it should boot out the con artist. EBay's free insurance covers losses up to $175, and Amazon.com covers most losses up to $250.

Call the cops. Charlotte Culver contacted the police in Pittsburgh, home to the person who had scammed her, and discovered that he was on probation for fraud. The bad guy went back to jail; Culver got her money back, and she remains an enthusiastic bidder and buyer at EBay and other auction sites.

For more tips on safe bidding, see "Don't Get Taken at Web Auctions," May (www.pcworld.com/may99/consumer_watch).

—Harry McCracken

> "When I started bidding, my husband laughed—but now he's addicted, too."
>
> **Cathy Piantagini, Somerville, Massachusetts—bids on vintage dishware and collectibles relating to her hometown**

you selected the option in your customer profile. UBid permits proxy bids only on certain items, and Egghead Auctions and First Auction don't allow them at all.

AUCTION WATCHING

IF PARTICIPATING IN one auction poses a challenge, managing several at the same time is tricky indeed, especially when you don't have a proxy system working for you. Every site we tested addresses this issue by providing bidders a personal page for keeping track of their auctions. EBay, Onsale, and UBid cover this beat particularly well, with password-protected pages that are chock-full of information. Amazon.com goes a step further, listing all of your active auctions on the home page every time you visit. Unfortunately, anyone with access to your computer and Web browser can see what you're bidding on. (Worst case scenario: Your coworkers discover your secret Beanie Baby fetish.)

Each auction site also e-mails you to confirm your initial bid and again to let you know when you win an auction. All except Egghead also send an e-mail when you've been outbid; this alert can be helpful when proxy bidding is not available.

Y ON EBAY: With around 2 million items up for grabs at any given time, the y auction site has something for virtually everybody.

2 You're a Winner! Now What?

WHETHER YOU SHOP at a merchant auction or at a person-to-person sale, the bidding process is essentially the same. But once you get an e-mail alerting you that you've won, the paths diverge.

With merchant auctions, the site already knows your credit card data and shipping address—you enter that information when you register. And when you place your first bid, you specify your shipping preference, such as next-day air.

So in theory, after you've won a merchant auction you don't have to lift a finger—the product just arrives. But a week after we won an Acer desktop PC for $547 at UBid, our personal page still said that the order was being processed. Customer support told us that the computer was on back order. Back order? It was there, we bid on it, we won it—right? Nope. The UBid representative said that occasionally a unit is found to be damaged, or UBid "can't get the system ordered." Customers of other online auctions have reported similar screwups.

UBid never charged our credit card for the missing-in-action Acer, but that didn't make the situation any less irksome. Nevertheless, being forgiving souls, we later bid on and bought a second system from UBid—this time without any hassles.

IN PERSON

IN PERSON-TO-PERSON transactions, you and the seller arrange payment and delivery terms. The seller's policies should be listed in the item description. You may be able to pay with a money order, a certified or personal check, or sometimes a credit card. (Escrow services are another option—see "Bidder Beware," page 196.) Sellers who accept personal checks typically don't send items until the check clears.

Our purchases at person-to-person sites went off without a hitch, with one nasty exception: The gent from whom we bought an old Sony VCR on Yahoo told us to add $28 for shipping via the U.S. Postal Service. That increased our cost for the $110 tape player by 25 percent. (The seller

(Continues on page 207) ▶

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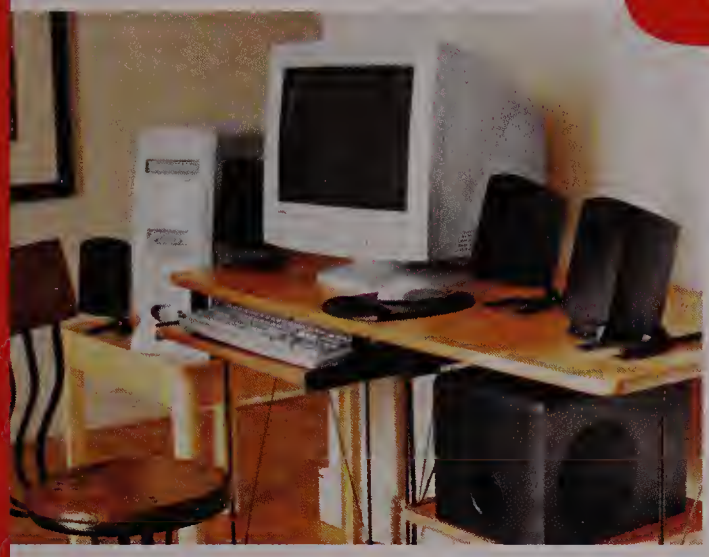

PRESARIO 5700T INTERNET PC

PRESARIO 5700T-550/3 INTERNET PC

Base price includes:

- Intel® Pentium® III Processor, 550 MHz
- 128 MB SyncDRAM expandable to 384 MB
- 22.0 GB UltraDMA Hard Drive[1]
- 6X DVD-ROM Drive[2]
- 32 MB Creative 3D Blaster TNT2 Ultra Graphics Accele
- Diamond Monster Sound MX300 PCI Audio Card
- 6.0Mb Max Digital Modem[4]
- JBL Pro Premium Speakers w/Subwoofer
- Digital Creativity Imaging Center[6]
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- Microsoft Windows®98
- Compaq CV915 19" Monitor (18.0" VIA)

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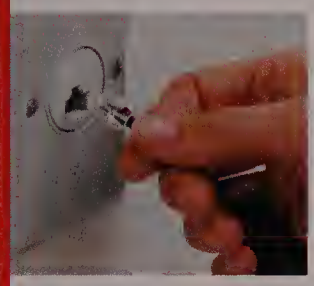
Personalize by choosing:

- 256 MB SyncDRAM: Add $300
- Read/Write CD-ROM Drive (4X/2X/24X)[8]: Add $19
- Tripp Lite Internet Office 500 UPS: Add $149.95

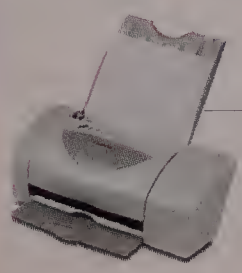
Compaq Innovations

Compaq, Klipsch, and Lucas Arts have joined forces to bring you Klipsch v.2-400, the first and only professional PC sound system with THX. With 3D sound and 400 watts of power, Klipsch speakers bring games, music, and the Internet to life.



Compaq Technology

Share Internet access, printers, files, and games with Home Phoneline Networking.[7] It's as easy as plugging in a phone.



Compaq Printers

IJ900 Printer (shown)	$199
IJ300 Printer	$119
A900 Printer	$399

PRESARIO 1800T INTERNET NOTEBOOK PC

PRESARIO 1900T INTERNET NOTEBOOK PC

PRESARIO 1800T-PII 400 INTERNET NOTEBOOK PC

Base price includes:

- Intel Mobile Pentium II Processor, 400 MHz
- 15.0" TFT Active Matrix Display
- 64 MB SyncDRAM expandable to 128 MB
- 6.4 GB UltraDMA Hard Drive[1]
- 4X DVD-ROM Drive[9]
- ATI Rage LT Pro Hardware Accelerated 3D Graphics w/8 MB Video Memory
- 56K ITU V.90 Modem[5]
- Smart LiIon Battery
- 256 KB Integrated "On-chip" cache
- 3.5" 120/1.44 MB High Capacity SuperDisk™ Drive
- Microsoft Office 2000 Small Business & Windows98

$2999‡ As low as **$84** per month†

Personalize by choosing:

- 128 MB SyncDRAM: Add $200
- Extra Smart LiIon Battery: Add $129
- 10.0 GB UltraDMA Hard Drive[1]: Add $150

Y2K COMPAQ PRODUCTS ARE YEAR 2000 HARDWARE COMPLIANT.††

All prices shown are Compaq Direct selling prices and do not include applicable sales tax and shipping, are valid in the U.S. only, and are subject to change or cancellation without notice. Not all models available in retail stor be higher. 2% check transaction fee ($2 min.–$15 max.). Fee waived for Compaq purchases billed directly to your account. ††System tested using NSTL YMARK2000 hardware test. Non-compliant third-party so CD-ROM data transfer rates may vary from 1800 to 4800 Kbps. [4]The 6.0Mb Max Digital Modem uses the ADSL/G.Lite protocol. ADSL/G.Lite/56K V.90 updates may be downloaded from Compaq's website when av ISP services. Maximum achievable download transmission rates with ADSL/G.Lite/56K V.90 are currently unknown, may not reach 6.0Mbps, and will vary with line conditions and distance. [5]ITU V.90 modems are c Networking and the Ethernet Port cannot be used simultaneously. Additional PC must have a network adapter, sold separately. AOL is a single user system and will not allow multiple users to access simultaneous maximum transfer rate of up to 5400 Kbps compared to 2nd generation DVD-ROM drives which run at a maximum transfer rate of up to 2705 Kbps. [10]24X Max CD-ROM data transfer rates may vary from 1500 t access does not include local telephone company charges, if any, or applicable taxes. Any long distance charges incurred will be the responsibility of the customer. Please make sure your access number is local. O valid credit card is required in order to initiate the service. Other conditions may apply. Compaq.NET offers unlimited Internet access starting at $11.99/month based on a prepaid 12-month service agr em registered trademark of America Online, Inc. NetZero is a trademark of NetZero, Inc. [19]Iomega and Zip are registered trademarks and Zip Built-In is a trademark of Iomega Corporation. One year parts and labor lab of Compaq. Microsoft, MS, and Windows are registered trademarks of Microsoft Corporation. Intel, the Intel Inside logo, and Pentium are registered trademarks and Celeron is a trademark of Intel Corporation. Product and

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Intel Pentium III Processor, 550 MHz	Intel Pentium III Processor, 500 MHz	Intel Pentium III Processor, 500 MHz	Intel Pentium III Processor, 450 MHz
128 MB SyncDRAM expandable to 384 MB	128 MB SyncDRAM expandable to 384 MB	128 MB SyncDRAM expandable to 384 MB	128 MB SyncDRAM expandable to 384 MB
17.0 GB UltraDMA Hard Drive[1]	17.0 GB UltraDMA Hard Drive[1]	17.0 GB UltraDMA Hard Drive[1]	17.0 GB UltraDMA Hard Drive[1]
6X DVD-ROM Drive[2]	6X DVD-ROM Drive[2]	6X DVD-ROM Drive[2]	6X DVD-ROM Drive[2]
ator Savage4 Pro 16 MB 2X AGP Graphics Card	Savage4 Pro 16 MB 2X AGP Graphics Card	Savage4 Pro 16 MB 2X AGP Graphics Card	Savage4 Pro 16 MB 2X AGP Graphics Card
Diamond Monster Sound MX300 PCI Audio Card	Diamond Monster Sound MX300 PCI Audio Card	ESS Solo PCI Audio	Diamond Monster Sound MX300 PCI Audio Card
56K ITU V.90 Modem[5]	56K ITU V.90 Modem[5]	56K ITU V.90 Modem[5]	56K ITU V.90 Modem[5]
Klipsch v.2-400 Speakers	JBL Pro Premium Speakers w/Subwoofer	JBL Pro Premium Speakers w/Subwoofer	Klipsch v.2-400 Speakers
Digital Creativity Imaging Center[6]	Digital Creativity Imaging Center[6]	Digital Creativity Imaging Center[6]	Digital Creativity Imaging Center[6]
Home Phoneline Networking PCI Card[7]	100 MB Iomega Zip Built-In™ Drive with 2 disks[12]	Microsoft Office 2000 Small Business	Microsoft Featured Home Collection + MS Word
Microsoft Featured Home Collection + MS® Word	Microsoft Office 2000 Small Business	Microsoft Windows98	Microsoft Windows98
Microsoft Windows98	Microsoft Windows98	Compaq CV715 17" Monitor (16.0" VIA)	Compaq CV715 17" Monitor (16.0" VIA)
Compaq CV715 17" Monitor (16.0" VIA)	Compaq CV715 17" Monitor (16.0" VIA)		
$2349‡ As low as **$66 per month†**	**$2149‡** As low as **$60 per month†**	**$1999‡** As low as **$56 per month†**	**$1899‡** As low as **$53 per month†**
APC SurgeArrest Pro SurgeStation Pro8TV: Add $69	Klipsch v.2-400 Speakers: Add $175	Read/Write CD-ROM (4X/2X/24X)[8]: Add $199	APC Back-UPS Office 280: Add $89
Hughes DirecPC Satellite: Add $349	Compaq CV915 19" Monitor (18.0" VIA): Add $190	Compaq V910 19" Monitor (18.0" VIA): Add $190	Home Phoneline Networking[7]: Add $39
32 MB Creative 3D Blaster TNT2 Ultra Graphics Accelerator: Add $109	Hughes DirecPC Satellite: Add $349	6.0Mb Max Digital Modem[4]: Add $99	100 MB Iomega Zip Built-In™ Drive with 1 disk[12]: Add $79

PRESARIO 1800T-PII 400 INTERNET NOTEBOOK PC	PRESARIO 1800T-C400 INTERNET NOTEBOOK PC	PRESARIO 1900T-PII 400 INTERNET NOTEBOOK PC	PRESARIO 1900T-PII 366 INTERNET NOTEBOOK PC
Intel Mobile Pentium II Processor, 400 MHz	Mobile Intel Celeron™ 400 MHz Processor	Intel Mobile Pentium II Processor, 400 MHz	Intel Mobile Pentium II Processor, 366 MHz
15.0" TFT Active Matrix Display	15.0" TFT Active Matrix Display	13.3" TFT Active Matrix Display	13.3" TFT Active Matrix Display
64 MB SyncDRAM expandable to 128 MB	64 MB SyncDRAM expandable to 128 MB	128 MB SyncDRAM expandable to 192 MB	64 MB SyncDRAM expandable to 192 MB
4.8 GB UltraDMA Hard Drive	4.8 GB UltraDMA Hard Drive[1]	6.4 GB UltraDMA Hard Drive[1]	6.4 GB UltraDMA Hard Drive[1]
24X Max CD-ROM Drive[10]	24X Max CD-ROM Drive[10]	4X DVD-ROM Drive[9]	4X DVD-ROM Drive[9]
ATI Rage LT Pro Hardware Accelerated 3D Graphics w/8 MB Video Memory	ATI Rage LT Pro Hardware Accelerated 3D Graphics w/8 MB Video Memory	256-bit AGP Accelerated Graphics w/2.5 MB VRAM	256-bit Accelerated Graphics w/2.5 MB VRAM
56K ITU V.90 Modem[5]	56K ITU V.90 Modem[5]	56K ITU V.90 Modem[5]	56K ITU V.90 Modem[5]
Smart Lilon Battery	Smart Lilon Battery	Smart Lilon Battery	256 KB Integrated "On-chip" cache
256 KB Integrated "On-chip" cache	128 KB Integrated "On-chip" cache	256 KB Integrated "On-chip" cache	Microsoft Featured Home Collection
Microsoft Featured Home Collection	Microsoft Featured Home Collection	Microsoft Office 2000 Small Business	Microsoft Windows98
Microsoft Windows98	Microsoft Windows98	Microsoft Windows98	
$2599‡ As low as **$73 per month†**	**$2399‡** As low as **$67 per month†**	**$2999‡** As low as **$84 per month†**	**$2599‡** As low as **$73 per month†**
128 SyncDRAM: Add $200	128 SyncDRAM: Add $200	Port Replicator: Add $129	128 MB SyncDRAM: Add $200
6.4 GB UltraDMA Hard Drive[1]: Add $100	6.4 GB UltraDMA Hard Drive[1]: Add $100	Extra Smart Lilon Battery: Add $129	Extra AC Adapter: Add $49
4X DVD-ROM Drive[9]: Add $200	Stylish Case: Add $119	Extra AC Adapter: Add $49	External Iomega® Zip® Drive[12]: Add $149

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- 32X Max CD-ROM Drive[3]
- Savage4 Pro 16 MB 2X AGP Graphics Card
- ESS Solo PCI Audio
- 56K ITU V.90 Modem[5]
- JBL Pro Amplified Speakers
- Digital Creativity Imaging Center[6]
- Microsoft® Featured Home Collection
- Microsoft Word
- Microsoft Windows®98
- Compaq CV715 17" Monitor (16.0" VIA)

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- 56K ITU V.90 Modem[5]
- Smart LiIon Battery
- 128 KB Integrated "On-chip" cache
- Microsoft Featured Home Collection
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And that's not counting all the goodies you can add on. Like Home Phoneline Networking,[7] which lets the entire family surf the Net at the same time. Super-fast DSL modems, so when DSL service comes to your area, you'll be able to surf at lightning speed. Plus, you can add an Ethernet port to make your PC cable and satellite modem-ready.

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attributed the steep charge to his cost for packing materials.) Lesson learned: Verify the shipping charge before you bid.

3 Getting the Goods

GENERALLY SPEAKING, the products we bought arrived reasonably quickly—anywhere from two days to two weeks after we made payment. As items hit our doorstep, we unpacked and inspected them, and in many instances we were pleased with what we found. Both computers—an IBM Aptiva desktop and the CTX notebook—looked good and worked perfectly out of the box. (We were unfazed by a small blemish on the notebook's case, since even brand-new laptops quickly acquire nicks and scuffs.) Other solid buys from merchant auctions included a color scanner from Onsale for $49, a Zebra golf putter from Egghead for $45, a cordless phone from First Auction for $45, and a handy-dandy Leatherman multipurpose tool from Amazon.com Auctions for $66.

IMPERFECT ITEMS

ON THE OTHER HAND, the refurbished 17-inch ViewSonic monitor from First Auction came with two connector cables but no power cord. (First Auction told us it would refund the price of a cable if we bought it ourselves and then invoiced the site for the cost—what a pain.) A refurbished Epson PhotoPC 700 digital camera from Egghead Auctions came with rechargeable batteries but no recharger. (Egghead responded, accurately, that the item listing did not mention a recharger.) The new 3Com PC Card modem from UBid was brand-new and cost just $87, about half what we might have paid at a retail store. But it was just a modem—no driver disk, no phone cord, no manual, no nothing. (The item listing didn't promise that these extras would accompany the modem, but it never occurred to us that they might not.)

> "Check shipping costs before you bid. It can be very unsettling to win an item for $15 only to find out afterward that it's going to cost you $20 to ship."
>
> **Rip Linton, Baker, Louisiana—bids on scientific collectibles**

The moral of these stories: Before placing a bid, you should check, double-check, and triple-check the item description to make sure you're buying what you think. And even then, don't be surprised if something's amiss, especially if you've bid on a refurbished product.

We had a better batting average with items from person-to-person auctions. The Mark McGwire rookie card and a DVD copy of *2001: A Space Odyssey* from Amazon.com Auctions, the Stephen King novel and a new graphics card from EBay, and the *Star Wars* poster and used VCR from Yahoo Auctions all lived up to their billing. So, at first glance, did the copy of Microsoft Office 97 Professional that we picked up for a mere $24 on EBay. Unfortunately, however, according to Microsoft, this copy of Office Pro was a forgery.

That revelation didn't stun us, given that Office Pro lists for $600—25 times what we paid. Illicit software may not be a bargain in any event: It's often buggy, virus-infested, or downright defective, and purchasers may be denied tech support and the ability to buy legitimate upgrades (see "Is Your Software Stolen?" December 1998, www.pcworld.com/dec98/piracy).

4 Closing Bid

ULTIMATELY, BUYING AT Web auctions is like being turned loose in a million-acre flea market. Spend enough time wandering the virtual aisles, and you'll come across good deals, so-so deals, a lot of junk, and the occasional bargain of the century.

If you're a businessperson who needs products right now, auctions don't make a whole lot of sense. Buying from a reliable retailer, mail-order merchant, or Web storefront is bound to be more efficient and less hazardous. But if you're looking to save money and don't mind refurbished or slightly outdated products, merchant auctions are definitely worth a look. And person-to-person sites are impossible to beat for rare collector's items.

Our bidding spree was frustrating at times, to be sure. But at its best, it was a blast—and the fun factor of auctions is a genuine point in their favor. As long as you start with a fair target price in mind and a knowledge of how the system works, the thrill of the hunt is undeniable.

Glenn McDonald is a freelance writer based in San Francisco. Harry McCracken is a senior writer for PC World. ■

"Still

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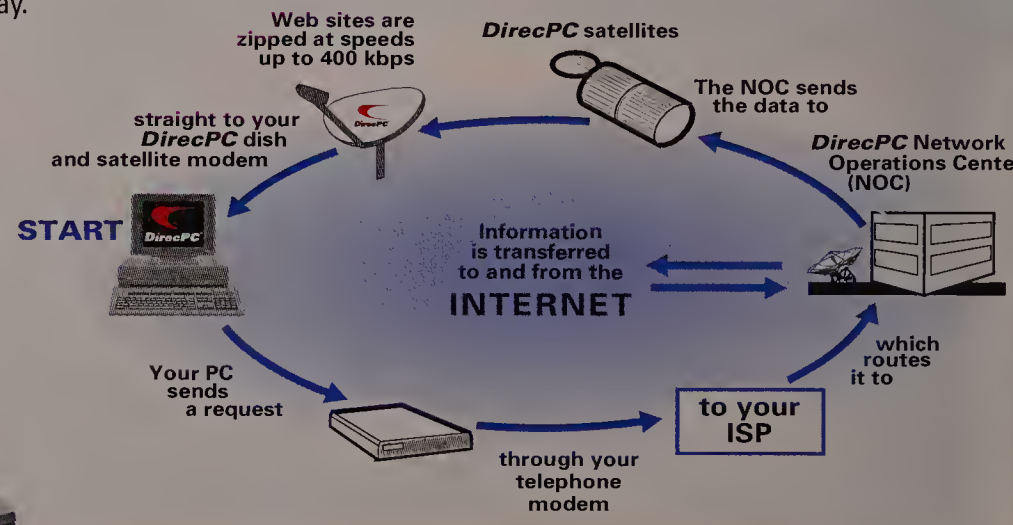
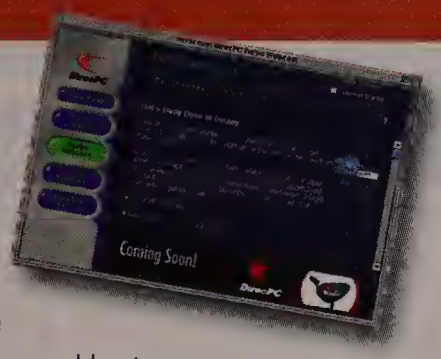
The engineers at Hughes figured out that the real bottleneck in the speed of the Internet wasn't the request **out** to the Web — telephone modems handle that just fine. Everything slows down when the Web tries to use the telephone system to send you **back** the media-rich information you requested. So, we use a much faster satellite connection for sending you the Web content you want. Check out the diagram — this is the system that makes DirecPC the fastest Internet access available nationwide.



waiting?"



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Price of Service Plan (Without ISP)	$19.99/Month	$34.99/Month	$109.99/Month
Hours of Service (Availability)	24 Hours a Day	24 Hours a Day	24 Hours a Day
On-Line Time (Hours of usage for Turbo Internet)	25 Hours /Month	100 Hours/Month	200 Hours/Month
Additional Hourly Rate (Including ISP) Additional Hourly Rate (Without ISP)	$1.99/Hour $.99/Hour	$1.99/Hour $.99/Hour	$1.99/Hour $.99/Hour
DirecPC Services			
Turbo Webcast: Broadcast delivery of popular Websites to your PC's hard drive	Included	Included	Included
Turbo Newscast: Broadcast delivery of up to 30,000 Usenet Newsgroups to your PC's hard drive	Included	Included	Included
Turbo Internet: Fully interactive access to the Internet at speeds up to 400Kbps	Included in Online Time	Included in Online Time	Included in Online Time
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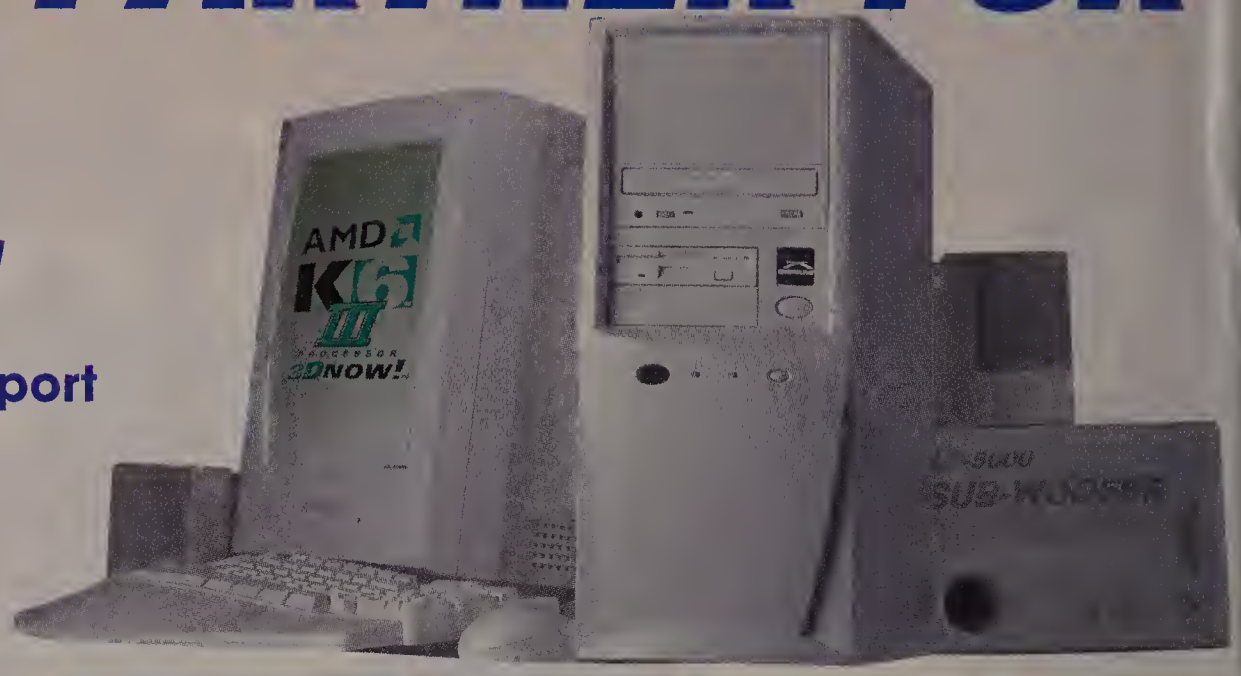

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- 40X CD-ROM Drive
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- Power 3D Stereo Sound System
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- 1.44MB Floppy Drive
- 3D Sound System with SubWoofer
- ATX Mid Tower Case
- 104 Win 98 Keyboard, Microphone & Mouse
- MS® Windows® 98
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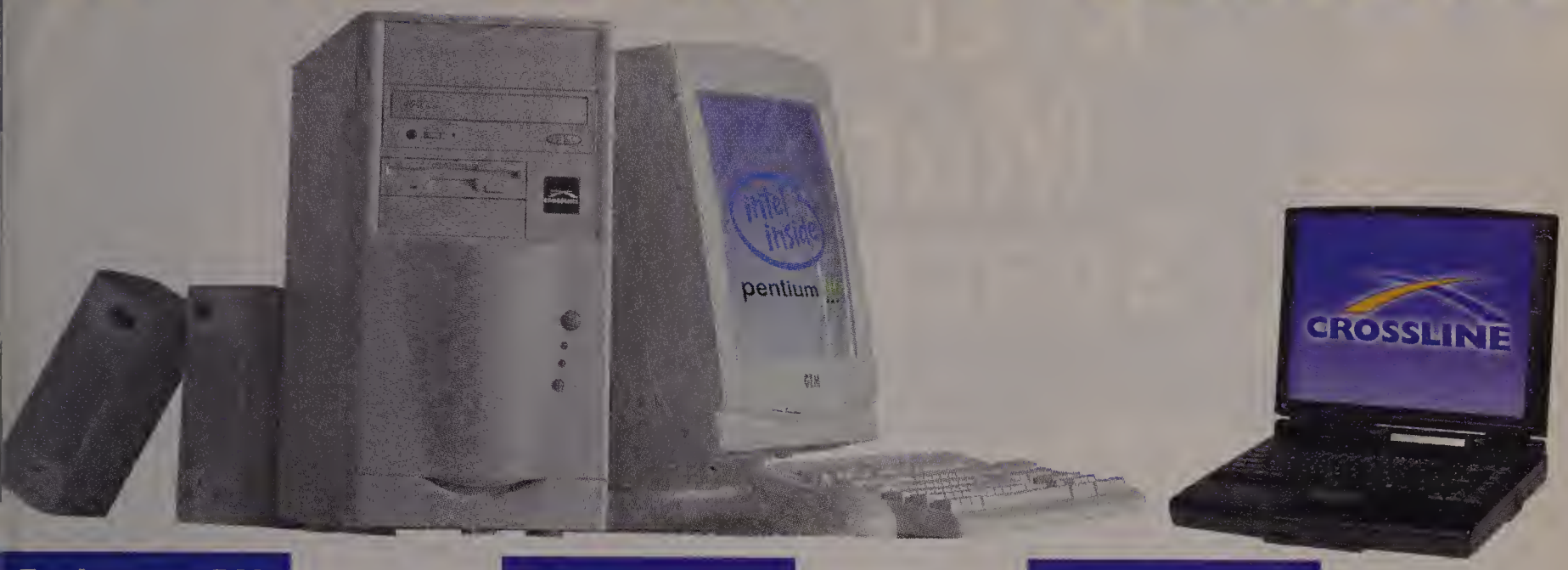

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- Creotive Lobs RIVA TNT 16MB AGP
- 4th Generation DVD-ROM Drive
- Aureol A3D™ Vortex 2 PCI Sound Cord
- 56K v.90 Voice Fox Modem
- 1.44MB Floppy Drive
- 3D Sound System with SubWoofer
- ATX Mid Tower Case
- 104 Win 98 Keyboord, Microphone & Mouse
- MS® Windows® 98
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Pentium® III Processor 450MHz	$1298
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Pentium® II Processor 400MHz	$1228
Pentium® II Processor 350MHz	$1208
Celeron‘ 466MHz with 128KB	$1188
Celeron‘ 400MHz with 128KB	$1128
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- 19" .26dp 1600x1200 Digitol Monitor
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- 2.1GB removable hord drive (OPtional HD Avoil.)
- 4MB SGRAM video
- Built in 3D audio, 1.44MB Floppy
- 24X CD-ROM, Built in sound ond speakers
- Full size B7 Key keyboard
- PS/2 interface trackpad module
- TV out port, USB port
- 2 type II or 1 type III PCMCIA
- AC-adapter, carrying cose
- NiMH Bottery Pack(Smort Lithium Ion bottery Optionol)
- Weight 7.2lbs with Bottery Pack
- Size: 12.2"W x 9.4"D x 1.7"H
- Windows 95 or Windows 9B
- 3 Yeor Limited Warronty
- 1 Year On-Site Service/24x7 Tech. Support

2.1GB	4.0GB	6.0GB
AMD-K6®-2/300 w/3DNow! ‘ 12.1" TFT		
$988	$1128	$1288
AMD-K6®-2/333 w/3DNow! ‘ 12.1" TFT		
$1198	$1238	$1338
AMD-K6®-2/333 w/3DNow! ‘ 13.3" TFT		
$1188	$1248	$1318
AMD-K6®-2/350 w/3DNow! ‘ 13.3" TFT		
$1228	$1278	$1348

Endeavor SX

Pentium® III 550MHz

$2088

- Intel® 440BX/LX AGPset 2 High Speed Seriol, 1 Game 1 Parallel, 2 USB
- 256MB 100MHz SDRAM
- 20.2GB Ultra ATA Hord Drive
- 19" .26dp 1600x1200 Digital Monitor
- ATI Fury 32MB w/TV Output
- 4th Generation DVD-ROM Drive
- Aureol A3D™ Vortex 2 PCI Sound Card
- 56K v.90 Voice Fox Modem
- 1.44MB Floppy Drive
- 3D Sound System with SubWoofer
- ATX Mid Tower Case
- Multimedia Keyboard
- MS® Windows® 9B & Intelli-Mouse
- 9B Gold CD Title Bundle
- Ability Office CD Softwore
- 3 Year Limited Worronty
- 1 Year On-Site Service/24x7 Tech. Support

Pentium® III Processor 500MHz	$1838
Pentium® III Processor 450MHz	$1628
Pentium® II Processor 450MHz	$1618
Pentium® II Processor 400MHz	$1568
Pentium® II Processor 350MHz	$1548
Celeron® 466MHz with 128KB	$1528
Celeron® 400MHz with 128KB	$1468
Celeron® 333MHz with 128KB	$1438

Columbia Sv2 Server

Single Pentium® II 400MHz w/512K

$2118

- Dual Intel® Pentium® II Processor 333-450MHz
- Intel® 440BX Chipset 100MHz with USB
- 64MB 100MHz SDRAM (Supports up to 512MB)
- Integroted Adoptec 7890 Ultro-2 SCSI Controller (80MB/s)
- Integrated RAIDport III
- 6 Expansion Slots
- 4.5GB Ultro-2/LVD SCSI Hord Disk Drive
- Trident 3D Imoge 9750 AGP Graphics Adapter w/4MB
- 32X Max SCSI CD-ROM Drive
- Intel® EtherExpress™ Pro 10/100
- 1.44MB Floppy Disk Drive
- 300W Full tower w/6 5 1/4" Ext. Boys, 3 3 1/2" Bays
- 104 Key Enhanced Windows Keyboord
- Microsoft PS/2 Mouse
- Microsoft NT Server 4.0 with 5 User License
- Intel® LANDesk® Client Manager for Windows NT
- Super Doctor Utility with PC Healh Monitoring
- Fully Tested ond Burned In
- 3 Year Limited Worronty
- 1 Year On-Site Service/24x7 Tech. Support

Single Pentium® II Processor 350MHz	$1948
Single Pentium® III Processor 450MHz	$2078
Single Pentium® III Processor 500MHz	$2338
Single Pentium® III Processor 550MHz	$2638

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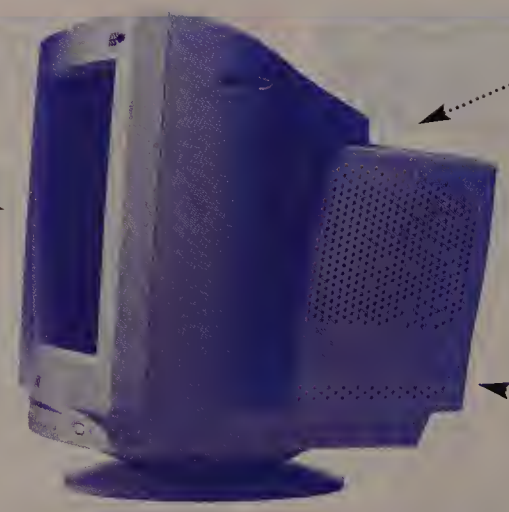
Why CTX®.....

When it comes to viewability, you need to look further than small dot pitch and high resolution. In addition to the superior picture quality delivered by 0.25mm dot pitch and 1600 x 1200 maximum resolution, CTX® VL950S & VL950SL give you something extra without burning a hole through your pocket: SPACE. With priced below the comparable 19" models from other leading brands and only taking up as little space as the conventional 17" monitors, VL950S & VL950SL go easy on your budget and space. So no more drilling on the wall to fit in your monitor!

VL950S

0.25mm dot pitch and 1600 x 1200 maximum resolution deliver outstanding screen performance with crisp, sharp images.



With 10% shorter in depth than the conventional 19" monitor, it provides more space for your computing environment.

USB

Integrated USB Powered Hub allows easy connection with your USB peripherals such as keyboards, printers, scanners, mice, joysticks and speakers..... (up to 127 devices total.)*

The Short-Length Value Series

Model	Screen Size	Viewable	Short Tube	Max. Resolution	Dot Pitch	USB* Powered Hub
VL700S/SL**	17"	15.9"	YES	1280x1024	0.27mm	YES
VL710S/SL**	17"	15.9"	YES	1600x1200	0.25mm	YES
VL950S/SL**	19"	18"	YES	1600x1200	0.25mm	YES

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PC WORLD

TOP 100

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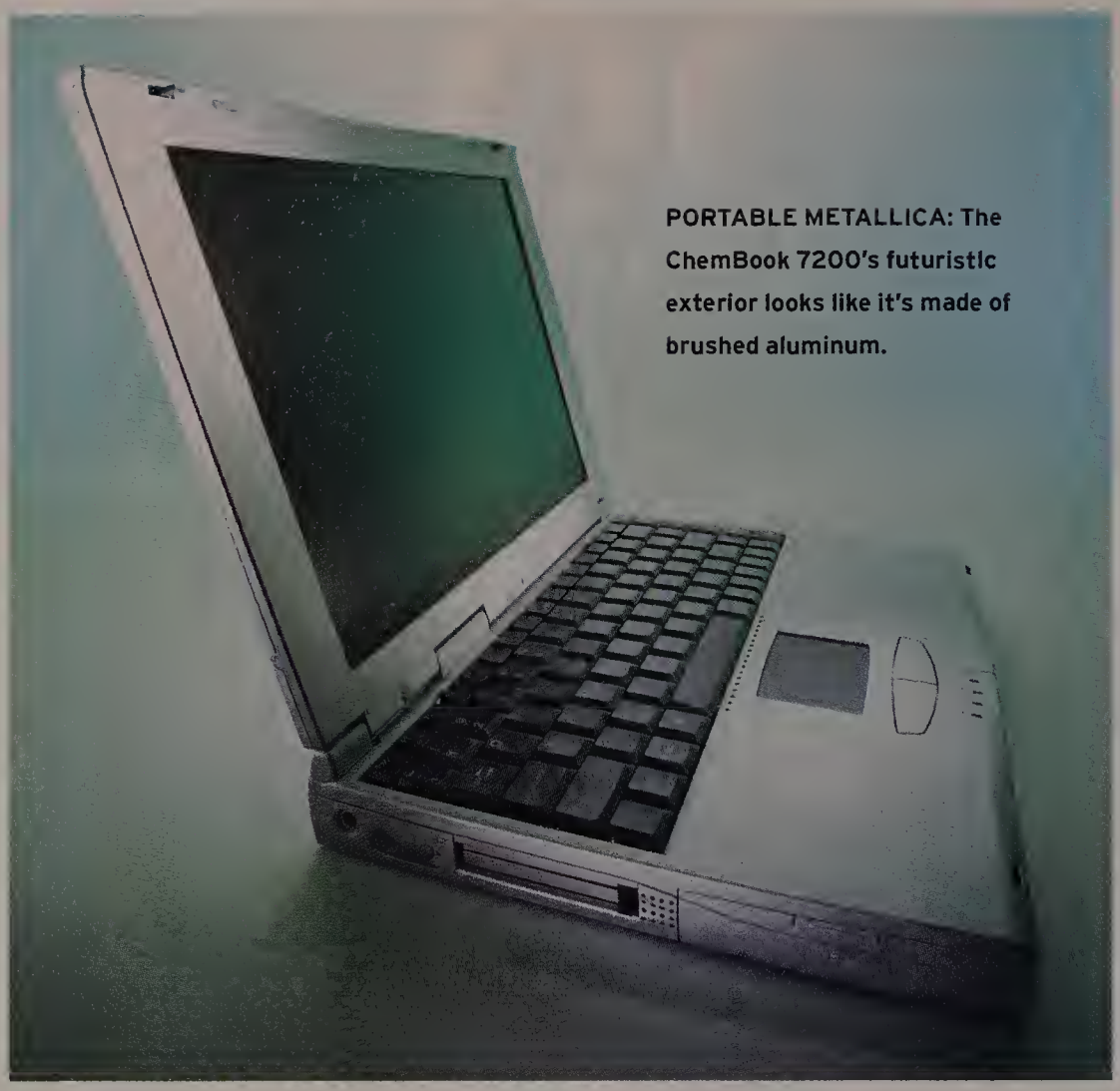
Pentium III-550: A Summer Blockbuster

By Michelle Campanale-Surkan

FANTASTIC DUO: Dell's Dimension XPS T550 (left) and Compaq's Deskpro EN 6550+ debut on the Power Desktops chart with record-breaking speed.



PORTABLE METALLICA: The ChemBook 7200's futuristic exterior looks like it's made of brushed aluminum.

IN QUICKER SUCCESSION THAN this summer's string of overhyped movies, new and ever-faster processors roll off Intel's assembly lines. In expeditious fashion, the chip maker's new Pentium III-550 processor zooms onto the *Top 20 Power Desktops* chart. Like many a high-budget Hollywood blockbuster, PCs housing the PIII-550 chip garner mixed reviews but also create enough buzz to grab your attention.

SPEED III

OVERALL, PCS EQUIPPED with the new processor run about 10 percent faster than their PIII-500 siblings and cost $300 to $800 more. The first two PIII-550 PCs we tested race onto the chart this month, and one even debuts as the top Best Buy.

Leading the way, Dell's Windows NT 4.0–based Dimension XPS T550 set a PC WorldBench 98 record score of 309. As such, it's the fastest machine to endure our test bench. The T550, a feature-rich SOHO user's delight, has both CD-RW and Zip drives yet is cost competitive, with a $2659 price tag. Dell's high reliability and service ratings in our reader surveys add to the system's appeal.

At the other end of the price scale, the Compaq Prosignia Deskpro EN 6550+ rings up at a hefty $3119. Its graphics features, including a crisp 19-inch monitor and a robust Matrox Millennium G200 graphics card, will please designers and Web developers. With a PC WorldBench 98 score of 300, however, it's 3 percent slower than the Dimension XPS T550.

ATTACK OF THE PIII-450s

PIII-550 PCS AREN'T the only systems stirring up a commotion. Three of the eight new PCs on the power chart carry Intel's PIII-450 processor, and are priced to move. One example: MidWest Micro's $1899 Business Solution XPP-450 racked up a PC WorldBench 98 score of 261, and comes equipped with an LS-120 drive, a network card, and a modem.

THE BIG CHEAP

IT WAS A BUSY month on the budget chart as well. Six new systems land on the Top 20, giving bargain shoppers a lot to choose from. Of these, CyberMax's AMD K6-III-400 Entrepreneur KIII-400A nabs the highest score. The fastest SOHO PC on the chart, it costs just $1299.

Two other budget Best Buys, PIII-450 systems from Micro Express and MidWest Micro, prove that smaller companies can deliver a winning combination of price, performance, and features. Support quality for both is rated only Fair, however; the lesson here is to keep an eye on service and support—two areas in which second-tier vendors typically trail their major-league competitors.

Though PIII-450 PCs earn high marks on both the power and budget charts, many companies are clearing out systems with these or other older processors to make way for the latest and greatest. MidWest Micro is the only company offering a new Pentium II-400 PC this month—at a time when most companies have dropped systems with that CPU from their lines entirely. A short-term bargain, the vendor's $1189 Office Pro 400 will likely be phased out before too long.

The same pattern is surfacing on the budget notebook chart, where the newer Celeron-333 laptops are replacing older PII-266 and PII-300 systems. One ultracheap notebook from a lesser-known vendor, the $1469 ChemBook 7200 from Chem USA, offers a lot for a superlow price. Although it won't win any design awards, this 6.9-pound notebook comes loaded with such essentials as a built-in

Keep an eye on service and support—these are two important areas in which second-tier vendors typically trail their major-league competitors.

floppy drive, a CD-ROM drive, a 56-kbps modem, and a battery that runs for 3.3 hours. Unlike many of its Top 10 competitors, the ChemBook lacks a DVD-ROM drive, but Chem USA says that a DVD laptop will be available soon.

MISSION IMPOSSIBLE

NONE OF THE six new color printers we tested this month made the chart. Although some of them fill the bill for buyers with specialized needs (photographers, for example, or those who have to print wide-format pages), their middling print quality and slow speeds will leave most other people underwhelmed.

Meanwhile, two older printers appear on the chart for the first time. Xerox's DocuPrint C20 climbs aboard thanks to a $100 price cut, while Canon's zippy BJC-6000 claims a spot vacated by its discontinued sibling, the BJC-4400. Check out *Top 10 Printers* for details.

VISION QUEST

SEEK AND YE SHALL FIND. That's the moral of this month's *Top 10 Monitors*. Seven of the ten reigning 17-inch displays offer excellent graphics quality, and many make great bargains. Two new monitors from Mitsubishi and Iiyama earn just such kudos. Mitsubishi's crisp Diamond Plus 71 boasts the second-lowest price tag, and Iiyama's affordable VisionMaster Pro 410 sports the latest in flat CRT technology.

NOW PLAYING: USB MODEMS

AUGUST MARKS the introduction of external USB modems to our *Top 10 Modems* testing. We looked at two USB external units—from Shark Multimedia and Viking Components—but only the latter made the chart. Both units stand out for their easy installation and unique designs. Tipping the scales at about 2 ounces, the Shark Multimedia Leopard Pocket USB is the smallest and lightest external modem we've seen—a great alternative to PCMCIA units in USB-equipped laptops. Viking's 56K USB grabs second place on the external modems list. A Viking rep says of the design, "We wanted to be different. We went vertical to save desk space." The largest unit we've tested, it stands nearly a foot high, weighs about a pound, and looks like a thick black shark fin slicing its way across your desk.

Michelle Campanale-Surkan is an associate editor for PC World. *Senior Editor Anita Epler; Senior Associate Editors Vince Bielski, Karen Silver, and Alan Stafford; Associate Editor Andrew Brandt; Staff Editors Grace Aquino and Mick Lockey; Assistant Editor Kalai Murugesan; and freelancers Gordon Meyer and Joel Strauch contributed to this month's* Top 100. *Testing was performed by Ulrike Diehlmann, Robert James, Elliott Kirschling, Jeff Kuta, Nancy Miller, and Mike Salayko of the PC World Test Center.* *See page 12 for contact information.*

THE SHAPE OF THINGS TO COME: Shark Multimedia's Leopard Pocket USB Modem (left) and Viking Components' 56K USB Modem feature styles all their own.

YOUR GUIDE TO THE TOP 100

QUESTIONS ABOUT OUR CHARTS? The following section should answer most of them.

How do the charts work? The Top 20 and Top 10 charts are evolving lists of the best computers, printers, graphics boards, monitors, and modems that we've tested. System charts are divided by price. Power desktops cost $1800 or more; power notebooks cost $2300 or more. We compare new products to previously reviewed units, updating the charts to reflect price cuts and other changes.

Where do you get your prices? We estimate street prices based on vendor information and our own research, including surveys of retail outlets. We recheck all prices every month.

What does the overall rating mean? This 100-point scale reflects results from our hands-on evaluations and performance tests. A score in the 90s is exceptional, while one in the 80s is among the best and one in the 70s above average.

What does the PC WorldBench 98 score mean? It's a measure of how fast a PC is in relation to our baseline machine, a Gateway PMMX-200 configured with 32MB of RAM, a 2GB hard drive, and 512KB of secondary cache. A PC that scores 200, for instance, is twice as fast as the baseline system.

Where do the scores for reliability, support quality, and support policies come from? Reliability and support quality scores are based on surveys of *PC World* readers and anonymous support calls made by *PC World* staff. The policies score is based on vendor support policies.

What do all those word scores mean? Word scores for performance and price are based on a product's rating in relation to other products in its category. For instance, we score the performance of Windows NT PCs separately from that of Windows 95 machines. (Based on our PC WorldBench 98 tests, Windows NT machines are faster on average than Win 95 PCs.)

Check out *PC World*'s Top 400 reviews online. Point your browser to PC World Online (www.pcworld.com/top400) to explore our Top 400, which provides comprehensive reviews and ratings for products in 16 different categories. You'll also find reviews not available in print.

PC WORLD

TOP 20 POWER DESKTOPS

	SYSTEM	Last month	Month tested	Street price (5/14/99)	CPU	Comments
1	Dell Dimension XPS T550 800/388-8542 www.dell.com	n/a	NEW	$2659	Pentium III-550	SOHO screamer comes with CD-RW and Zip drives; mediocre keyboard.
2	Dell OptiPlex GXlp 500 800/388-8542 www.dell.com	1	June 99	$2544	Pentium III-500	Corporate workstation has speed, great features and design, and top reliability.
3	Gateway E-4200 500 800/315-2536 www.gateway.com	3	Apr 99	$2629	Pentium III-500	Speedy network-managed PC gets $160 price cut.
4	CyberMax Enthusiast 500 800/437-4596 www.cybermaxpc.com	5	May 99	$1899	Pentium III-500	CyberMax slashes $200 off fast, low-cost small-business system.
5	Quantex SM500 800/896-4898 www.quantex.com	6	May 99	$2099	Pentium III-500	$200 off quick, feature-rich multimedia PC; has Zip drive, useful business software.
6	Micron Millennia Max 500 888/634-8799 www.micronpc.com	4	Apr 99	$2783	Pentium III-500	Speedy SOHO PC sheds $116; features include 22GB hard drive and 6X DVD-ROM.
7	MidWest Micro Business Solution XPP-450 800/728-8582 www.mwmicro.com	n/a	NEW	$1899	Pentium III-450	Zippy, inexpensive; sports LS-120 drive, ergonomic keyboard; sound is mediocre.
8	NEC PowerMate VT 300i 888/632-8701 www.nec-computers.com	n/a	NEW	$2133	Pentium III-500	Sparkling display, great support policies, and a low price on robust SOHO unit.
9	IDot.com 500P3BX 888/388-4368 www.idot.com	8	July 99	$2174	Pentium III-500	$124 price cut on fast SOHO PC with 4.8X DVD-ROM drive and 14.4GB hard drive.
10	CyberMax Entrepreneur PIII-450A 800/437-4596 www.cybermaxpc.com	n/a	NEW	$1999	Pentium III-450	Mighty, bargain-priced system comes with 19-inch monitor and Zip drive.
11	NEC PowerMate 8100 888/632-8701 www.nec-computers.com	9	Jan 99	$2069	Pentium II-450	Inexpensive corporate PC includes network card and USB-enhanced monitor.
12	Compaq Deskpro EN 6550+ 800/345-1518 www.compaq.com	n/a	NEW	$3119	Pentium III-550	Expensive but fast PIII-550 has top-notch graphics, Fair vendor reliability rating.
13	Sys Performance AX-500P3 800/613-9963 www.sys.com	7	May 99	$2299	Pentium III-500	Windows NT PC is fast and feature-rich, but manuals and support need work.
14	IBM PC 300PL 800/426-2968 www.ibm.com/ibmpc	n/a	NEW	$2705	Pentium III-500	Costly, managed PC boasts a Zip drive, a 20.4GB hard drive, and a 19-inch monitor.
15	Acma ZPower 8500 PIII-500 800/786-6888 www.acma.com	n/a	NEW	$2099	Pentium III-500	Business PC is low-priced but sluggish for its class; supports digital LCD screen.
16	Compaq Deskpro EN 6450+ 800/345-1518 www.compaq.com	n/a	NEW	$2882	Pentium III-450	Managed PC packs a load of features, but it will cost you; uninspiring support.
17	Compaq Prosignia Desktop 330 800/345-1518 www.compaq.com	n/a	May 99	$2432	Pentium III-500	$367 off quick, small-business PC with Zip drive and 5X DVD-ROM drive; affordable.
18	IBM PC 300PL 800/426-2968 www.ibm.com/ibmpc	11	Jan 99	$2139	Pentium II-450	Quick, network-ready desktop; retail only; to order, use model #6862fxj.
19	Premio Apollo BX 500 800/677-6477 www.premiopc.com	10	May 99	$2599	Pentium III-500	$201 off pricey SOHO PC with skimpy multimedia; great speed and good support.
20	Polywell Poly 8450 B5 800/999-1278 www.polywell.com	16	Jan 99	$1825	Pentium II-450	$100 cut on fastest tested Pentium II-450 with Win 9B; weak on service and support.

Best Buy See features chart, page 218; test report, page 220.

Find updated street prices online (www.pcworld.com/powerdesktops/late_prices).

n/a = not applicable

[1] A system's performance word score is relative to the scores of other PCs running the same operating system. For more details see "Your Guide to the Top 100" on page 215.

[2] For more information about all of the products listed in this table, select product info number 901 or visit www.pcworld.com/productinfo.

THE FIRST PENTIUM III-550 PCs blast onto the power chart this month. Dell's Dimension XPS T550 and Compaq's Deskpro EN 6550+ are the fastest systems to pass through our labs, cracking 300 on our PC WorldBench 98 tests. As you'd expect, these power machines are priced accordingly, with Compaq's corporate system at $3119 and the small-business Dimension XPS T550 debuting at a more affordable $2659. Meanwhile, price drops on PCs with older processors, such as the PIII-450 and PIII-500, haven't been very aggressive. Most models shed just $150 to $200. Nevertheless, with six new PIII-450 and PIII-500 systems on the chart this month, you'll find a lot to choose from.

SCORECARD

★ Overall rating	PC WorldBench 98/operating system	Performance [1]	Features and design	Vendor's system reliability	Price	Vendor's support quality/policies	Product info number [2]
94	309/Win NT 4.0	Outstanding	Very good	Outstanding	Expensive	Good/Good	–
91	284/Win NT 4.0	Very good	Very good	Outstanding	Average	Good/Outstanding	–
90	235/Win 98	Outstanding	Very good	Good	Expensive	Good/Outstanding	611
89	236/Win 98	Outstanding	Very good	Fair [3]	Very inexpensive	Good [4]/Good	612
88	235/Win 98	Outstanding	Very good	Good [3]	Inexpensive	Good [4]/Good	613
86	237/Win 98	Outstanding	Very good	Good	Expensive	Fair/Good	614
85	261/Win NT 4.0	Good	Very good	[3]	Very inexpensive	Fair [4]/Outstanding	615
85	231/Win 98	Outstanding	Good	Good	Inexpensive	Good [4]/Outstanding	616
83	232/Win 98	Outstanding	Very good	[3]	Inexpensive	Fair [4]/Good	617
83	257/Win NT 4.0	Good	Outstanding	[3]	Inexpensive	Fair [4]/Good	618
81	218/Win 95	Good	Good	Fair [3]	Inexpensive	Good [4]/Outstanding	619
80	300/Win NT 4.0	Outstanding	Very good	Fair	Very expensive	Fair/Good	620
80	287/Win NT 4.0	Very good	Very good	[3]	Average	Fair [4]/Good	621
79	232/Win 98	Outstanding	Good	Good	Expensive	Good/Good	–
78	218/Win 98	Good	Very good	[3]	Inexpensive	Good [4]/Good	622
77	268/Win NT 4.0	Good	Very good	Fair	Very expensive	Fair/Good	623
77	228/Win 98	Very good	Good	Fair	Average	Fair/Good	624
77	219/Win 98	Good	Good	Good	Inexpensive	Good/Good	–
77	233/Win 98	Outstanding	Very good	[3]	Expensive	Good [4]/Fair	625
76	224/Win 98	Very good	Very good	[3]	Very inexpensive	Fair [4]/Fair	626
Scorecard weightings ▶		Performance 25 percent	Features 25 percent	Reliability 15 percent	Price 15 percent	Quality/policies 10 percent each	

[3] Insufficient data to give a rating, or the rating is derived from the vendor's Reliability and Service survey scores for its home PCs.

[4] Due to insufficient data from the Reliability and Service survey for the vendor's work PCs, this rating is derived from anonymous support-quality calls, from survey scores for the vendor's home PCs, or from both.

This Month's Best Buys

1 DELL DIMENSION XPS T550

PRO: Superfast performance, inexpensive for a PIII-550, includes both Zip and CD-RW drives

CON: Mediocre keyboard and speakers

There's no question why Dell's new 550-MHz Dimension XPS T550 is numero uno on our power chart. One of the first PIII-550 systems we've tested, it easily outperforms everything we've seen so far. Its PC WorldBench 98 score of 309 sets a new Windows NT 4.0 speed record and beats the score of its closest competitor, Compaq's Deskpro EN 6550+ (number 12 on the chart). Priced at $2659, the Dell is also $460 cheaper than the Deskpro.

Designed for power users, the Dimension XPS T550 includes not one but two removable-storage devices: a Zip drive and a CD-RW drive, making it especially useful for creating custom CD-ROMs and backing up large amounts of data. Even with both removable-storage devices installed, the Dimension XPS T550's spacious and easy-to-open case includes three empty drive bays and four free slots for accommodating future expansion.

A system this high on the food chain normally features top-of-the-line sound. Instead, Dell keeps costs down by pairing Yamaha's powerful XG 64Voice sound chip with good but entry-level speakers from Harman Kardon. Another quibble: The keyboard that Dell supplies feels a bit flimsy.

Dell Dimension XPS T550

Dell garnered top honors in *PC World's* recent Reliability and Service survey, in which our readers rated the reliability of Dell PCs as Outstanding. In addition, Dell offers good service and support policies, including a three-year parts/one-year labor warranty and free 24-hour support. As usual, Dell's support staff gave us accurate advice on a range of questions in our anonymous calls.

2 DELL OPTIPLEX GX1P 500

PRO: Great performance, easy-access case, top-notch company reliability and support policies

CON: PCI-based graphics, so-so monitor

If you're looking for a high-performance corporate workstation, put Dell's $2544 OptiPlex GX1p 500 on your shopping list. No other system here matches its combination of speed, features, vendor reliability, and support.

Dell OptiPlex GX1p 500

The GX1p 500 is a great choice for any organization with a host of computers and a very busy IS staff. For fast upgrades or repairs, the case's side panels lift off quickly, and you can easily pull out the card-slot tray for efficient board-swapping.

Our test machine came with Microsoft's Natural Keyboard, featuring keys ▶

PHOTOGRAPHS: KEN SMITH

TOP 20 POWER DESKTOPS

STANDARD FEATURES

	SYSTEM [1]	CPU	Operating system	RAM (MB)	Level 2 cache (KB)	Hard drive (GB)	Graphics adapter (AGP unless noted)	Video RAM (MB/type)	Monitor tube/ viewable diagonal (inches)	56-kbps modem protocol
1	Dell Dimension XPS T550*	Pentium III-550	Windows NT 4.0	128	512	20	Diamond Viper TNT 30	16/SDRAM	17/15.8	V.90
2	Dell OptiPlex GX1p 500*	Pentium III-500	Windows NT 4.0	128	512	20	STB NVidia TNT (PCI)	16/SDRAM	17/15.9	Not included
3	Gateway E-4200 500*	Pentium III-500	Windows 98	128	512	22	ATI Rage 128GL	16/SDRAM	19/18	Not included
4	CyberMax Enthusiast 500*	Pentium III-500	Windows 98	128	512	13.6	ST8 Velocity 4400	16/SDRAM	19/17.9	V.90
5	Quantex SM500*	Pentium III-500	Windows 98	128	512	13	STB Velocity 4400	16/SDRAM	19/17.9	V.90
6	Micron Millennia Max 500	Pentium III-500	Windows 98	128	512	22	Diamond Viper V550	16/SDRAM	19/17.9	V.90
7	MidWest Micro Business XPP-450	Pentium III-450	Windows NT 4.0	128	512	13	ATI Rage Pro 128	32/SDRAM	17/16	V.90
8	NEC PowerMate VT 300i	Pentium III-500	Windows 98	128	512	13	Diamond Viper V550	16/SDRAM	17/16	V.90
9	IDot.com 500P3BX	Pentium III-500	Windows 98	128	512	14.4	Creative Graphics 8laster RIVA TNT	16/SDRAM	17/15.8	V.90
10	CyberMax Entrepreneur PIII-450A	Pentium III-450	Windows NT 4.0	128	512	20	STB Velocity 4400	16/SDRAM	19/17.9	K56flex
11	NEC PowerMate 8100	Pentium II-450	Windows 95	64	512	14.4	Accel Graphics AccelStar 30 II	8/SDRAM	17/15	Not included
12	Compaq Deskpro EN 6550+	Pentium III-550	Windows NT 4.0	128	512	22	Matrox Millennium G200	8/SGRAM	19/18.3	Not included
13	Sys Performance AX-500P3	Pentium III-500	Windows NT 4.0	128	512	10.1	Matrox Millennium G200	8/SGRAM	19/17.9	Not included
14	IBM PC 300PL	Pentium III-500	Windows 98	128	512	20.4	ST8 Velocity 4400	16/SDRAM	19/17.8	Not included
15	Acma ZPower 8500 PIII-500	Pentium III-500	Windows 98	128	512	16.8	STB Velocity 4400	4/SGRAM	19/18	Not included
16	Compaq Deskpro EN 6450+	Pentium III-450	Windows NT 4.0	128	512	22.7	Matrox Millennium G200	16/SGRAM	19/17.9	Not included
17	Compaq Prosignia Desktop 330	Pentium III-500	Windows 98	128	512	22.6	STB NVidia TNTv	16/SDRAM	19/18	V.90
18	IBM PC 300PL	Pentium II-450	Windows 98	64	512	9.1	Matrox Millennium G200	8/SGRAM	17/16	Not included
19	Premio Apollo BX 500	Pentium III-500	Windows 98	128	512	14.4	Diamond Viper V550	16/SDRAM	19/18	V.90
20	Polywell Poly 8450 B5	Pentium II-450	Windows 98	128	512	10.1	Matrox Millennium G200	8/SGRAM	17/16	V.90

* Best Buy

[1] Configuration as tested. Vendor may have since changed components.

[2] *PC World* defines vertically oriented cases as towers (taller than 20 inches), midtowers (15.5 to 20 inches), or minitowers (shorter than 15.5 inches); and horizontally oriented cases as desktop (5 inches or taller) or compact (shorter than 5 inches).

arranged for ergonomically proper positioning of your hands and arms while typing. Though we found it comfortable to use and reasonably easy to adjust to, the layout won't please everybody; you should definitely test-drive a Natural Keyboard before deciding to buy one.

Besides a whopping 20GB hard drive, you also get a 100MB Zip drive. The system offers six open slots—plenty of room for additional adapters—but a scant two open drive bays. In keeping with the OptiPlex line's corporate focus, a network interface card comes standard on the GX1p; for $89 you can opt for an Aztech Rockwell V.90 modem instead.

The unit's only significant flaw is the 17-inch Dell 1028L monitor—it produced somewhat dark images and slightly fuzzy text. Upgrading to the superior 19-inch Dell UltraScan 1200HS costs about $200.

Setting up the OptiPlex is straightforward. All the ports are color-coded, making it easy to hook up devices. Dell includes surprisingly detailed documentation for this corporate PC: user guides for all the peripherals, an in-depth system installation manual, a big foldout chart, and a guide for assistance once you're up and running. Plus, Dell maintains around-the-clock technical support.

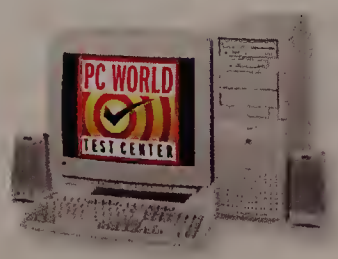
Respondents to our most recent survey gave the company Outstanding marks for reliability. And Dell's service, while not perfect, still ranks among the best you can find in the industry.

3 GATEWAY E-4200 500

PRO: Great speed, good management features

CON: Expensive

Gateway's $2629 E-4200 500 remains one of the most expensive PIII-500 machines appearing on this month's power list. Nevertheless, this imposingly tall and wide midsize tower has a great deal to recommend it. In fact, the system easily qualifies as one of our top choices for offices that are looking for a power-packed, multimedia-equipped business workstation.



Gateway E-4200 500

Besides bearing such corporate accoutrements as an ethernet card and DMI management software, the E-4200 500 delivers top-notch performance—as measured

		EXPANDABILITY				CUSTOMER SUPPORT			
CD/DVD-ROM drive speed	Sound board	Case style [2]	Max. RAM (MB)	Open RAM sockets	Open drive bays (ext./int.)	Open slots	Warranty for parts/labor (years)	Weekday toll-free support (hours)	Weekend support	Online support
2X CD-RW	Yamaha XG Wavetable Sound	Midtower	76B	2	2/1	4	3/1	24	Sat, Sun	AOL, BBS, CIS, MSN, WWW
17X-40X	Integrated Crystal Audio	Midtower	76B	2	1/1	6	3/3	24	Sat, Sun	AOL, BBS, CIS, MSN, WWW
13X-32X	Sound Blaster AWE64D	Midtower	3B4	2	3/2	2	3/3	24	Sat, Sun	AOL, BBS, CIS, MSN, WWW
4.8X DVD-ROM	Aztech PCI 33B-A3D	Midtower	3B4	1	3/3	4	3/1	24	Sat, Sun	BBS, WWW
6X DVD-ROM	Sound Blaster PCI64V	Midtower	3B4	1	2/2	4	3/1	24	Sat, Sun	BBS, WWW
6X DVD-ROM	Sound Blaster Live Value	Midtower	3B4	2	2/1	3	Varies [3]/1	24	Sat, Sun	BBS, CIS, WWW
17X-40X	Sound Blaster PCI12B	Midtower	76B	2	3/1	2	Varies [3]/3	24	Sat, Sun	BBS, WWW
14X-32X	Integrated Sound Blaster Audio	Minitower	256	1	1/1	3	3/3	24 [4]	Sat, Sun	AOL, BBS, CIS, MSN, WWW
4.8X DVD-ROM	Turtle Beach Montego II PCI	Midtower	1024	3	3/0	3	Varies [3]/1	24	Sat, Sun	WWW
32X-40X	Creative Ensoniq AudioPCI	Minitower	3B4	1	2/5	3	3/1	24	Sat, Sun	BBS, WWW
17X-40X	Integrated Crystal 4235	Midtower	3B4	2	2/1	5	3/3	24 [4]	Sat, Sun	AOL, BBS, CIS, MSN, WWW
14X-52X	Aztech ASC33BA	Midtower	3B4	2	1/1	5	3/1	24	Sat, Sun	AOL, BBS, CIS, WWW
14X-40X	Sound Blaster AWE64	Midtower	1024	3	3/2	4	Varies [5]/5	24	Sat, Sun	WWW
17X-40X	Integrated Crystal Audio	Midtower	3B4	2	1/1	5	3/1	24 [4]	Sat, Sun	AOL, BBS, CIS, WWW
24X-40X	Integrated Yamaha DS1-L AC '97	Midtower	3B4	2	2/1	4	3/1	24	Sat, Sun	BBS, WWW
14X-52X	Integrated ESS AudioDrive	Midtower	3B4	2	2/0	5	3/1	24	Sat, Sun	AOL, BBS, CIS, WWW
5X DVD-ROM	Sound Blaster PCI12B	Midtower	3B4	2	0/1	3	3/1	24	Sat, Sun	AOL, BBS, CIS, Prodigy, WWW
14X-32X	Integrated Crystal PnP	Desktop	3B4	2	1/0	4	3/1	24	Sat, Sun	AOL, BBS, CIS, WWW
14X-32X	Sound Blaster Live	Midtower	1024	3	3/2	4	3/3	10	None	BBS, WWW
4X DVD-ROM	Aztech PCI 33B-A3D	Midtower	1024	3	3/1	3	3/5	24	Sat, Sun	WWW

[3] Five years on CPU and main RAM, three years on other parts.

[4] Toll-free tech support limited to three years.

[5] Six years on CPU and main RAM, three years on other parts.

by the PC World Test Center—and an excellent audiovisual experience. This unit's PC WorldBench 98 score of 235 puts it in a virtual dead heat with the other two Best Buys that ran on Windows 98.

The system's ATI Rage 128GL graphics card helps the 19-inch Gateway monitor display images vividly, and the Altec Lansing GCS100 speakers and subwoofer offer rich sound. Gateway supplies excellent documentation, and the company's record for reliability and service in support of its work PCs remains strong.

PC buyers who are more price-conscious should consider the Pentium III-450 version of the E-4200. At $2179, it costs $450 less than its 500-MHz sibling. Moreover, it chalked up a creditable PC WorldBench 98 score of 220.

4 CYBERMAX ENTHUSIAST 500

PRO: Terrific performance, competitive price, attractive features

CON: Case cover tricky to get on and off, technical support difficult to reach

With a $200 price cut, CyberMax's speedy small-office/home-office entry, the Enthusiast 500, makes an even better bargain this month. This $1899 midsize tower is priced exceptionally well for a full-featured Pentium III-500 computer.

Its 236 score on PC WorldBench 98 puts the Enthusiast only a point below our fastest Windows 98 PC, Micron's Millennia Max 500. The bottom line: No one will be able to detect a whit of speed difference between these two PCs. The Enthusiast offers so much power that, even with several applications running in the background and without a dedicated MPEG decoder board, DVD movie images appear both vibrant and silky smooth. We played the movie *Twister* at full-screen size with no problem. The included Altec Lansing ADA305 Digital PowerCube speakers and subwoofer's great sound made the tornado in the movie sound frighteningly true to life.

CyberMax Enthusiast 500

We had to fiddle somewhat with the Enthusiast's case cover to remove it, but the system's interior layout looked good, providing easy access to memory slots and sensibly organized cabling. CyberMax provides clear documentation, and it ▶

backs its systems with a long parts warranty and around-the-clock support.

This tech support, though, is also our one beef. Staffers, while courteous and informative, tended to miss our tougher questions in our anonymous calls. Also, we waited up to 55 minutes and had to call three times before reaching a live person. In our recent Reliability and Service survey, *PC World* readers rated the reliability of CyberMax's home PCs as Fair and the quality of the company's support as Good.

5 QUANTEX SM500

PRO: Great performance on nicely loaded PC

CON: Cover is a bit difficult to slide on and off

The Quantex SM500 moves into Best Buy territory this month on the strength of a $200 price cut. This powerful Pentium III-500 machine, now $2099, brings an embarrassment of riches to the desktop, with just about everything that a small workgroup or home office might need, from top-notch performance to an attractive array of multimedia features to a well-rounded software bundle.

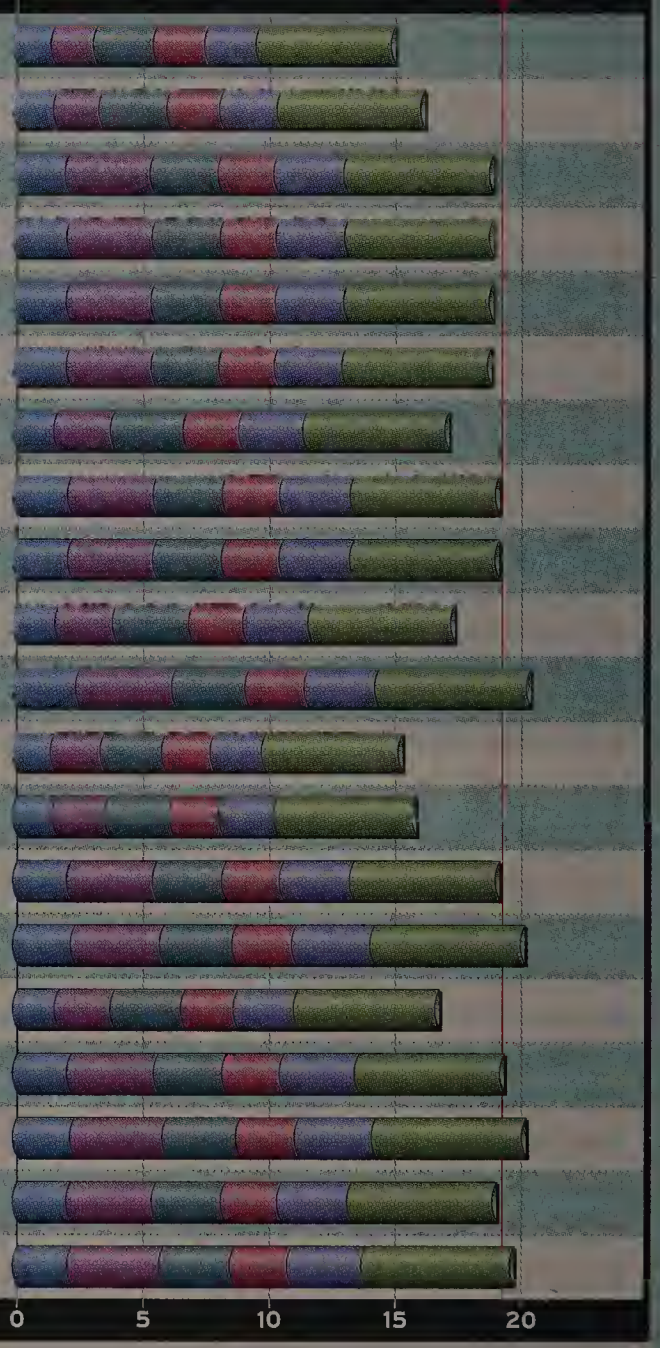
Quantex SM500

If speed is what you want, note that the SM500 scored a blistering 235 on PC WorldBench 98, which places it in a league with the fastest Windows 98 computers on the chart. The 19-inch monitor displays crisp images and comes with easy-to-adjust controls; the Altec Lans- ▶

TOP 20 POWER DESKTOPS

TEST REPORT

	SYSTEM	CPU	Operating system	RAM (MB)	Level 2 cache (KB)	PC WorldBench 98 score
1	Dell Dimension XPS T550*	Pentium III-550	Win NT 4.0	128	512	309
2	Dell OptiPlex GX1p 500*	Pentium III-500	Win NT 4.0	128	512	284
3	Gateway E-4200 500*	Pentium III-500	Win 98	128	512	235
4	CyberMax Enthusiast 500*	Pentium III-500	Win 98	128	512	236
5	Quantex SM500*	Pentium III-500	Win 98	128	512	235
6	Micron Millennia Max 500	Pentium III-500	Win 98	128	512	237
7	MidWest Micro Business XPP-450	Pentium III-450	Win NT 4.0	128	512	261
8	NEC PowerMate VT 300i	Pentium III-500	Win 98	128	512	231
9	IDot.com 500P3BX	Pentium III-500	Win 98	128	512	232
10	CyberMax Entrepreneur PIII-450A	Pentium III-450	Win NT 4.0	128	512	257
11	NEC PowerMate 8100	Pentium II-450	Win 95	64	512	218
12	Compaq Deskpro EN 6550+	Pentium III-550	Win NT 4.0	128	512	300
13	Sys Performance AX-500P3	Pentium III-500	Win NT 4.0	128	512	287
14	IBM PC 300PL	Pentium III-500	Win 98	128	512	232
15	Acma ZPower 8500 PIII-500	Pentium III-500	Win 98	128	512	218
16	Compaq Deskpro EN 6450+	Pentium III-450	Win NT 4.0	128	512	268
17	Compaq Prosignia Desktop 330	Pentium III-500	Win 98	128	512	228
18	IBM PC 300PL	Pentium II-450	Win 98	64	512	219
19	Premio Apollo BX 500	Pentium III-500	Win 98	128	512	233
20	Polywell Poly 8450 B5	Pentium II-450	Win 98	128	512	224



*Best Buy

TEST PC WORLD CENTER **HOW WE TEST** All systems are tested with PC WorldBench 98, *PC World*'s application-based benchmark. A higher PC WorldBench score is better. All PCs are tested with Windows 95, Windows 98, or Windows NT 4.0, and video resolution is set to 800 by 600 in 65,536 colors. We run automated scripts on six popular business applications, performing common tasks such as spelling checks, scrolls, saves, sorts, and recalculations. The PC World8ench 98 score is a sum of the weighted, normalized result of each script: Word 97 (10 percent), Word Pro 97 (10 percent), Excel 97 (20 percent), 1-2-3 97 (20 percent), Paradox 8.0 (20 percent), and Picture Publisher 7.0 (20 percent). For more details on our benchmark and how we run it, see PC World Online (www.pcworld.com/testing). [1]Under Windows 98 with 128MB of RAM; also includes systems tested in this and previous months that do not currently rank among the Top 20.

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ing ADA305 speaker system fills the room with rich sound; and the 6X DVD-ROM drive delivers flawless video playback. Bundled applications include Microsoft Office Small Business Edition, Microsoft Money, and Compton's Home Library.

We do have a few design quibbles, however. The PC's connectors come labeled with stickers that may peel and fall off, leaving inexperienced users to puzzle over what goes where; the keyboard clacks noisily; and removing or replacing the case cover requires finesse. But once inside the PC, we found well-organized cabling and unobstructed access to the memory and expansion slots.

Quantex includes well-written, sensibly organized documentation, including an illustrated foldout to guide setup. The vendor backs its PCs with a three-year parts warranty and one year of labor coverage.

New This Month

The following systems made our Power Desktops chart for the first time this month. For brief reviews of all previously tested machines on the chart, visit our Web page (www.pcworld.com/top400).

7 MIDWEST MICRO BUSINESS SOLUTION XPP-450

PRO: Inexpensive for its class, includes LS-120 drive and ergonomic keyboard

CON: None major

MidWest Micro offers a good deal of computer for relatively little money. Its $1899 Pentium III-450 Business Solution XPP-450 earned a score of 261 on our PC WorldBench 98 test—above average for an NT-based PC, though not the fastest.

MidWest Micro also includes numerous appealing features, such as Microsoft's sturdy and ergonomically designed Natural Keyboard. The crisp 17-inch monitor and the ATI Rage Pro 128 graphics card clearly display small text and the thinnest fonts at a high, 1280 by 1024 resolution.

MidWest Micro Business Solution XPP-450

The case's side panels slide off without the aid of tools. Once inside, the chassis gives you easy access to all components for maintenance and upgrades. And while most companies include either a modem or an ethernet adapter with their PCs, MidWest Micro joins the small but growing number of vendors that have begun including both. The company also provides a 120MB LS-120 SuperDisk drive, which can read and write to standard 3.5-inch floppies.

The XPP-450's sound was pleasing in our tests. MidWest Micro pairs the middle-of-the-road Sound Blaster PCI128 audio card with Monsoon's flat-panel speakers, which sport a cool look, with metal grates and a black subwoofer. Fidelity is good, volume adequate.

Support policies are excellent, including a five-year warranty on the CPU and main RAM, and 24-hour phone support. In our anonymous calls, MidWest Micro's technical support reps gave us accurate but abrupt responses to our questions.

8 NEC POWERMATE VT 300I

PRO: Outstanding performance, inexpensive, front-panel USB port, detailed monitor manual

CON: Limited expansion capability, free tech support limited to three years

Priced $300 less than its similarly configured peers, NEC's $2133 PowerMate VT 300i offers a great configuration for small businesses and home offices. Its PC WorldBench 98 score of 231 is Outstanding, though among all tested systems in its class, it ranks in the middle.

The PIII-500 PC comes equipped with a USB port on the front of the case—handy for adding peripherals, since you don't have to sidestep a tangle of cords to reach a port at the back of the system. This convenience, though, isn't without cost: The USB cord winds throughout the interior of the PC and blocks access to some expansion card slots. In fact, this minor annoyance is typical of the VT 300i, a fast, relatively low-cost PC that sacrifices some usability for innovation.

The system's sharp 17-inch monitor is backed by a 16MB Diamond Viper V550 graphics card, but text appeared fuzzy at the highest resolution. The PowerMate VT 300i's 13GB hard drive provides plenty of room but is smaller than the hard disks of many other PCs on the chart. NEC includes extras such as a wrist rest (albeit a detachable and flimsy one), plus a handy Microsoft Intellimouse.

NEC PowerMate VT 300i

The case opens easily enough, but you may not like what's inside. In addition to the obstructive USB cord, the peripheral power cords almost completely cover the RAM slots, making it tough to find the slots, much less upgrade memory. Upgradability is limited to two PCI slots, one shared PCI/ ISA slot, and one free externally accessible bay.

NEC's excellent monitor manual contains detailed information, with lots of diagrams, about topics from troubleshooting to ergonomics. Too bad the company doesn't include similar documentation for the PC itself. Should you need additional help, you can call techs on a toll-free line 24 hours a day. Unfortunately, free tech support ends after three years. You get a three-year parts and labor warranty, in case anything breaks. In our anonymous calls to NEC's support line, reps gave us prompt and knowledgeable advice.

10 CYBERMAX ENTREPRENEUR PIII-450A

PRO: 19-inch monitor, Zip drive, great speakers, exceptional expandability, good performance

CON: Mediocre support

If room to grow is a priority when choosing a system, it's hard to beat CyberMax's Entrepreneur PIII-450A. This minitower comes with numerous expansion options and sells for $1999. It also earned a relatively high score of 257 in our PC WorldBench 98 tests.

CyberMax Entrepreneur PIII-450A

Most companies include two or three open drive bays in their PCs, but CyberMax goes a step further. Even with an internal Zip drive installed, the Entrepreneur still sports two open 5.25-inch bays for DAT, CD-RW, or DVD-ROM ▶

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drives, plus five available internal bays.

One of the few machines on the chart that includes both a modem and an ethernet adapter, the system makes an ideal choice for business PC buyers who want to cruise the Internet without going through a network. The Entrepreneur PIII-450A delivers top-notch multimedia capabilities, thanks to robust-sounding Altec Lansing ACS 45.1 speakers and subwoofer, and the 19-inch CyberMax CX900N monitor displays pictures at high resolutions (1600 by 1200) without losing clarity.

CyberMax backs its systems with warranties of three years on parts and one year on labor, as well as around-the-clock support. In our anonymous calls to CyberMax's support line, technical reps were generally unhelpful.

12 COMPAQ DESKPRO EN 6550+

PRO: Exceptional graphics, new Pentium III-550 processor

CON: Pricey, Fair reliability score

One of first PIII-550s we've tested, Compaq's $3119 Deskpro EN 6550+ debuts as the most expensive system on our chart. However, the premium price gets you impressive speed, top-notch components, and some unique features.

If you need ultrahigh-resolution graphics, the Deskpro is a good choice. With a PC WorldBench score of 300, it's fast enough to run graphics-intensive programs smoothly. The system includes a roomy 22GB hard drive, one of the biggest we've seen, and its 19-inch monitor supports razor-sharp text and graphics at resolutions as high as 1600 by 1200, making it ideal for sophisticated design work.

The Deskpro EN 6550+ offers tool-free case removal and access to the interior that may remind you of a copier: Quick-release latches get you inside, where everything is color-coded. The expansion card cage rises to let the system board slide out. The drive cage tilts from the chassis, and the drives don't require rails or brackets. If such an easy-open system raises security concerns, the Deskpro's Smart Cover Lock lets you control access via software over a network.

Compaq Deskpro EN 6550+

In *PC World*'s recent Reliability and Service survey, readers rated the reliability of Compaq's systems as just Fair. The company backs its systems with a three-year parts and one-year labor warranty, and free 24-hour support. When we called, Compaq's technical reps gave us so-so answers to our test questions.

14 IBM PC 300PL

PRO: Large hard drive, Zip drive

CON: Expensive for its class

Although IBM markets a number of competitively priced computer systems, the PIII-500 PC 300PL is not one of them. That isn't to say that the 300PL is unworthy. On the contrary, its PC WorldBench performance falls within a mere five points of that of the fastest PIII-500 Windows 98 machine we've tested, and its features, including a large 20.4GB hard drive and an internal Zip drive, are on a par with or exceed those of its peers.

But at over $2700, the 300PL lies at the high end of the price scale. Other vendors sell comparable systems for as much as $600 less. IBM backs its systems with a three-year parts/one-year labor warranty, and limits free phone support to three years. We had varying degrees of success reaching reps during our anonymous calls; when we did get through, techs were knowledgeable if somewhat impatient.

IBM PC 300PL

15 ACMA ZPOWER 8500 PIII-500

PRO: Low price, easy-to-open case, LS-120 drive

CON: Slow for its class

There's a lot to like about Acma's ZPower 8500. The second least expensive PIII-500 PC we've seen so far, only CyberMax's Enthusiast 500 has a lower sticker price. Acma gets high marks for using a well-designed, easy-to-open case that provides unencumbered access to all components—such as the LS-120 drive.

Video geeks will appreciate the bundled 19-inch monitor's superhigh 1600 by 1200 resolution and the ability to plug both a TV (via S-video) and a digital monitor directly into the system. Alas, its PC WorldBench 98 score is more consistent with those of PIII-450 machines than those of PIII-500 systems.

Acma ZPower 8500 PIII-500

Acma backs the ZPower with a three-year parts and one-year labor warranty and 24-hour phone support. Friendly technicians provided thorough (although sometimes inaccurate) answers to our questions.

16 COMPAQ DESKPRO EN 6450+

PRO: Good performance, excellent high-resolution graphics, spacious interior

CON: Expensive; just passable sound

One of the most unusual things about this PIII-450 system is its interior design. Although most computers' expansion boards plug directly into slots on the motherboard, Compaq's attach to a second card that sits on the motherboard at a 90-degree angle. This gives the case a roomier feel. And pack rats will appreciate the expansive 22.7GB hard drive. For performance, the Deskpro tops others in its class. Powered by a Matrox Millennium G200 graphics card, the 19-inch Compaq display delivers sharp, clear text and images, even at the maximum resolution of 1600 by 1200.

Compaq Deskpro EN 6450+

Unfortunately, Compaq integrates both the sound card and speakers into the computer, which results in compromised fidelity. Another complaint: the price. At $2882 it's one of the most expensive PIII-450 systems on the market. ▶

BEYOND THE TOP 20

online

We evaluated the following system along with the others, but it didn't score high enough to reach the *Top 20 Power Desktops* chart. For a write-up, visit PC World Online (www.pcworld.com/t20pcs).

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PC WORLD

TOP 20 BUDGET DESKTOPS

	SYSTEM	Last month	Month tested	Street price (5/14/99)	CPU	Comments
1	Quantex M400C 800/896-4898 www.quantex.com	1	June 99	$1449	Celeron-400	Near-PII-400 speed, Zip drive, DVD-ROM drive, and 19-inch monitor for under $1500.
2	Dell Dimension XPS T450 800/388-8542 www.dell.com	n/a	June 99	$1699	Pentium III-450	$330 off fast PC previously on the power chart; solid support ratings and features.
3	CyberMax Entrepreneur KIII-400A 800/437-4596 www.cybermaxpc.com	n/a	NEW	$1299	AMD K6-III-400	Fastest Windows 98 system on the chart is low priced and feature rich.
4	Micro Express MicroFlex-50B 800/989-9900 www.microexpress.net	n/a	NEW	$1499	Pentium III-450	Highly expandable PC is superfast and loaded; support needs work.
5	MidWest Micro Office Pro XPO 450 800/728-8582 www.mwmicro.com	n/a	NEW	$1349	Pentium III-450	Swift business system sports a 6X DVD-ROM drive, great warranty; support is lukewarm.
6	Xi Computer 400A MTower 800/432-0486 www.xicomputer.com	11	June 99	$1299	Celeron-400	Xi's small-business system is the fastest Celeron-400 we've tested; $180 price cut.
7	Micron Millennia Max 450 888/634-8799 www.micronpc.com	n/a	July 99	$1659	Pentium III-450	$340 off fast PC with 6X DVD-ROM drive and hardware decoder; cover is hard to remove.
8	MidWest Micro Office Pro 400 800/728-8582 www.mwmicro.com	n/a	NEW	$1189	Pentium II-400	Cheap business PC comes with 15-inch monitor but performs well; support is subpar.
9	MidWest Micro Office MWO-433C 800/728-8582 www.mwmicro.com	10	June 99	$1149	Celeron-433	Small-business system includes LS-120 drive; so-so support quality.
10	Sys Technology TaskMaster Z366C 800/613-9963 www.sys.com	6	Apr 99	$1299	Celeron-366	Great expandability and good support policies, including super parts warranty.
11	NEC PowerMate VT 300 888/632-8701 www.nec-computers.com	n/a	NEW	$1249	Celeron-366	NEC offers good support and a crisp monitor with its low-cost SOHO PC.
12	Axis Systems Metropolis NX5-333C 800/378-9014 www.axissys.com	14	Mar 99	$915	Celeron-333	Only sub-$1000 machine on the chart gets $53 trimmed from its price.
13	Sys Technology AX-450 P3 800/613-9963 www.sys.com	n/a	NEW	$1799	Pentium III-450	Managed PC boasts power-chart performance; pricey for a budget system.
14	Premio Shadowhawk 400C 800/677-6477 www.premiopc.com	17	July 99	$1389	Celeron-400	Fast and expandable small- and home-office PC costs $210 less; short support hours.
15	Micro Express MicroFlex-4C 800/989-9900 www.microexpress.net	n/a	Apr 99	$1299	AMD K6-2-400	Inexpensive small-office PC includes a 4X DVD-ROM drive and good support policies.
16	CompUSA American Pro 366 888/226-6772 www.compusapc.com	n/a	Apr 99	$1299	Celeron-366	$200 off small-office PC with good sound and a Zip drive; mediocre performance.
17	IDot.com 400K6-2 888/388-4368 www.idot.com	18	June 99	$1114	AMD K6-2-400	$160 cut on SOHO PC with good support policies but no software bundle.
18	Sys Technology TaskMaster 350K2 800/613-9963 www.sys.com	15	Jan 99	$1299	AMD K6-2-350	Inexpensive and expandable PC comes equipped with 40X CD-ROM drive.
19	Acma Exp 6433 800/786-6888 www.acma.com	n/a	July 99	$1499	Celeron-433	LS-120 drive, 4.8X DVD-ROM with decoder offered on speedy small-biz PC.
20	IBM PC 300 GL, Small Business Series 800/426-2968 www.ibm.com/ibmpc	19	May 99	$1709	Pentium II-400	Small-business minitower has network card; sluggish for a PII-400 PC.

Best Buy See features chart, page 228; test report, page 230. Find updated street prices online (www.pcworld.com/budgetdesktops/late_prices).

n/a = not applicable

[1] A system's performance word score is relative to the scores of other PCs running the same operating system. For more details see "Your Guide to the Top 100" on page 215.

[2] For more information about all of the products listed in this table, select product info number 903 or visit www.pcworld.com/productinfo.

YOU SAY YOU WANT BARGAINS? This month's budget chart gives you plenty to choose from. More than half of the Top 20 machines cost under $1300, and they're not stripped-down PCs either. Nearly half sport DVD-ROM drives, almost all come with 17-inch monitors, and their average hard drive size is a good 10.5MB. You can get a loaded small-business system from a vendor like CompUSA, IDot.com, MidWest Micro, and NEC for $1110 to $1300. On the high end of the budget scale, Sys Technology offers a fast, new corporate PC ready to be added to the company network for under $1800. But if brand-name security is what you prefer, check out our number two Best Buy, Dell's $1699 Dimension XPS T450.

SCORECARD

★ Overall rating	PC WorldBench 98/operating system	Features and design	Price	Performance [1]	Vendor's system reliability	Vendor's support quality/policies	Product info number [2]
93	198/Win 98	Very good	Average	Good	Good [3]	Good [4]/Good	674
91	218/Win 98	Good	Expensive	Outstanding	Outstanding	Good/Good	–
90	223/Win 98	Very good	Inexpensive	Outstanding	[3]	Fair [4]/Good	675
90	222/Win 98	Very good	Average	Outstanding	[3]	Fair [4]/Good	676
87	211/Win 98	Good	Average	Very good	[3]	Fair [4]/Outstanding	677
84	199/Win 98	Very good	Inexpensive	Good	[3]	Fair [4]/Good	678
84	216/Win 98	Good	Expensive	Outstanding	Good	Fair/Good	679
84	199/Win 98	Good	Inexpensive	Good	[3]	Fair [4]/Outstanding	680
83	190/Win 98	Good	Inexpensive	Good	[3]	Fair [4]/Outstanding	681
82	193/Win 98	Good	Inexpensive	Good	[3]	Fair [4]/Good	682
81	181/Win 98	Satisfactory	Inexpensive	Satisfactory	Good	Good [4]/Outstanding	683
80	198/Win NT 4.0	Satisfactory	Very inexpensive	Satisfactory	[3]	Good [4]/Outstanding	684
79	266/Win NT 4.0	Very good	Expensive	Very good	[3]	Fair [4]/Good	685
79	196/Win 98	Good	Average	Good	[3]	Good [4]/Fair	686
78	183/Win 98	Good	Inexpensive	Satisfactory	[3]	Fair [4]/Good	687
78	188/Win 98	Good	Inexpensive	Satisfactory	[3]	Fair [4]/Good	688
78	184/Win 98	Good	Inexpensive	Satisfactory	[3]	Fair [4]/Good	689
77	181/Win 98	Good	Inexpensive	Satisfactory	[3]	Fair [4]/Good	690
76	195/Win 98	Good	Average	Good	[3]	Good [4]/Good	691
74	185/Win 98	Good	Expensive	Satisfactory	Good	Good/Good	–
Scorecard weightings ▶		Features 25 percent	Price 22 percent	Performance 18 percent	Reliability 15 percent	Quality/policies 10 percent each	

[3] Insufficient data to give a rating, or the rating is derived from the vendor's Reliability and Service survey scores for its home PCs.

[4] Due to insufficient data from the Reliability and Service survey for the vendor's work PCs, this rating is derived from anonymous support-quality calls, from survey scores for the vendor's home PCs, or from both.

This Month's Best Buys

1 QUANTEX M400C

PRO: Fast and well appointed for a budget PC

CON: None significant

PC users on the hunt for a budget small-office/home-office system will be hard-pressed to do better than Quantex's Celeron-400 machine. This $1449 midsize tower is fast and bears features commonly found on much more expensive systems. The M400C earned a PC WorldBench 98 score of 198; less than half of the PCs on the chart can match or beat that speed when running productivity apps, and most of those systems cost hundreds of dollars more.

Controls on the spacious Quantex XP190N 19-inch monitor are intuitive and easy to use. The unstinting software bundle includes Corel WordPerfect Suite 8 and reference titles such as Compton's World Atlas and American Heritage Talking Dictionary. The system also comes with an Iomega Zip drive and a 4.8X DVD-ROM drive with software decoder.

A simple-to-follow system manual and illustrated foldout setup guide accompany the M400C. If you need to call tech support for help, the support policies are fairly standard. You can reach technicians 24 hours a day, and the company backs the system with a three-year parts and one-year labor warranty.

Quantex M400C

In our anonymous calls to tech support, reps were easy to reach and responded courteously, but they didn't always supply accurate answers to our tough or intermediate-level questions. Respondents in our latest Reliability and Service survey gave Quantex's home PCs Good ratings in both of those categories.

2 DELL DIMENSION XPS T450

PRO: Good manuals and support, terrific company reliability and performance

CON: Monitor picture quality just adequate; one of the priciest systems on the chart

For most small businesses, especially those that lack an IS staff, PC reliability and service are key concerns. Dell's unmatched reputation for reliable PCs, well-written documentation, and solid support help make this $1699 PIII-450 midsize tower a solid Top 20 value. And a $330 price drop this month makes the PC that much more affordable.

Dell Dimension XPS T450

The quick T450 is a great alternative to the more expensive PIII-500 systems on on the Power Desktops chart. There's a lot to like about the Dimension XPS T450, and most of its features are quite creditable. However, a few are nothing to e-mail home about. For example, at this price you don't get a 19-inch monitor in the standard configuration. If you don't like the T450's bun- ▶

TOP 20 BUDGET DESKTOPS

STANDARD FEATURES

	SYSTEM [1]	CPU	Operating system	RAM (MB)	Level 2 cache (KB)	Hard drive (GB)	Graphics adapter (AGP)	Video RAM (MB/type)	Monitor tube/ viewable diagonal (inches)	56-kbps modem protocol
1	Quantex M400C*	Celeron-400	Windows 98	128	128	13	STB Velocity 4400	16/SGRAM	19/17.7	V.90
2	Dell Dimension XPS T450*	Pentium III-450	Windows 98	64	512	13.6	STB NVidia TNT	16/SDRAM	17/16	V.90
3	CyberMax Entrepreneur KIII-400A*	AMD K6-III-400	Windows 98	128	256 [3]	10	Joy Media Apollo Media 2	16/SGRAM	17/15.6	V.90
4	Micro Express MicroFlex-50B*	Pentium III-450	Windows 98	64	512	18	ATI Rage 128GL	32/SDRAM	17/16	V.90
5	MidWest Micro Office Pro XP0 450*	Pentium III-450	Windows 98	64	512	10.1	ATI Rage 128GL	16/SDRAM	17/15.8	V.90
6	Xi Computer 400A MTower	Celeron-400	Windows 98	128	128	14	Matrox Mystique G200	8/SDRAM	17/16	V.90
7	Micron Millennia Max 450	Pentium III-450	Windows 98	64	512	13	Diamond Viper V550	16/SDRAM	17/15.9	V.90
8	MidWest Micro Office Pro 400	Pentium II-400	Windows 98	64	512	10	ATI Xpert@Play98	8/SGRAM	15/13.8	V.90
9	MidWest Micro Office MW0-433C	Celeron-433	Windows 98	64	128	8.4	Integrated ATI 3D Rage Pro	8/SDRAM	17/16	V.90
10	Sys Technology TaskMaster Z366C	Celeron-366	Windows 98	64	128	6.4	Diamond Monster Fusion	16/SGRAM	17/15.7	V.90
11	NEC PowerMate VT 300	Celeron-366	Windows 98	64	128	8.4	ATI Xpert98	8/SDRAM	17/16.1	Not included
12	Axis Systems Metropolis NX5-333C	Celeron-333	Windows NT 4.0	64	128	4.3	Intel 740	8/SDRAM	17/15.7	Not included
13	Sys Technology AX-450 P3	Pentium III-450	Windows NT 4.0	128	512	10	Matrox Millennium G200	8/SGRAM	17/15.9	Not included
14	Premio Shadowhawk 400C	Celeron-400	Windows 98	128	128	8.4	Matrox Millennium G200	8/SGRAM	17/15.9	V.90
15	Micro Express MicroFlex-4C	AMD K6-2-400	Windows 98	64	1024	10	Diamond Monster Fusion	16/SGRAM	19/17.9	V.90
16	CompUSA American Pro 366	Celeron-366	Windows 98	64	128	13.5	STB Velocity 4400	16/SDRAM	17/15.6	V.90
17	IDot.com 400K6-2	AMD K6-2-400	Windows 98	64	1024	10.1	Card Expert Intel 740	8/SDRAM	17/15.9	V.90
18	Sys Technology TaskMaster 350K2	AMD K6-2-350	Windows 98	64	512	10.1	Matrox Millennium G200	8/SGRAM	17/15.8	V.90
19	Acma Exp 6433	Celeron-433	Windows 98	64	128	10.1	STB Velocity 128	8/SGRAM	17/16	V.90
20	IBM PC 300 GL, Small Business	Pentium II-400	Windows 98	64	512	8.4	Integrated S3 Trio 3D	4/SGRAM	17/15.8	V.90

* Best Buy

[1] Configuration as tested. Vendor may have since changed components.

[2] *PC World* defines vertically oriented cases as towers (taller than 20 inches), midtowers (15.5 to 20 inches), or minitowers (shorter than 15.5 inches); and horizontally oriented cases as desktop (5 inches or taller) or compact (shorter than 5 inches).

dled 17-incher, you can upgrade to the 19-inch UltraScan 1200HS for an extra $200.

Belying its name, the Dell QuietKey keyboard clacked a bit when we typed on it; nonetheless, it felt comfortable and durable. Images on the 17-inch Dell M780 monitor appeared somewhat fuzzy, but the screen works fine for basic business tasks. The bundled Harman/Kardon HK195 speakers yield decent acoustics, though we've heard fuller, richer sound from a number of Altec Lansing models. The T450's software bundle includes Microsoft Office Small Business Edition and Microsoft Streets Plus.

The Dimension is nicely designed for users who need to get their machines up and running in a hurry. The PC's color-coded cables make connecting peripherals easy, and the well-written manuals include lots of helpful illustrations.

The T450's tidy interior provides plenty of room to add more devices—it has four free expansion slots and four free drive bays. That's a good thing, since at this price the system comes without a Zip drive; you can add one from Dell for $79. Another nice touch inside: Dell has placed a ventilation hood over the CPU to shunt excess heat from the processor directly out the PC's back panel.

Our readers consistently rank Dell highly in our Reliability and Service surveys. If you do run into trouble, you can call Dell's toll-free tech support lines any time, day or night. And when you call, you'll likely receive a high quality of service, as we did in our anonymous support checks.

3 CYBERMAX ENTREPRENEUR KIII-400A

PRO: Inexpensive, top performance for its class, DVD-ROM and Zip drives, great speakers

CON: So-so graphics card

For small-business and home-office users who need to stretch their dollars, it's hard to beat CyberMax's $1299 Entrepreneur KIII-400A. With a PC WorldBench score of 223, this 400-MHz AMD K6-III–based computer outperforms most of the Pentium II-400 and even some Pentium III-450 Windows 98 machines that we've tested—yet it costs

CyberMax Entrepreneur KIII-400A

		EXPANDABILITY					CUSTOMER SUPPORT			
CD/DVD-ROM drive speed	Sound board	Case style [2]	Max. RAM (MB)	Open RAM sockets	Open drive bays (ext./int.)	Open slots	Warranty for parts/labor (years)	Weekday toll-free support (hours)	Weekend support	Online support
4.8X DVD-ROM	Sound Blaster PCI64	Midtower	384	1	2/3	4	3/1	24	Sat, Sun	BBS, WWW
17X-40X	Integrated Yamaha YMF724F-V	Midtower	768	2	3/1	4	3/1	24	Sat, Sun	AOL, BBS, CIS, MSN, WWW
4.8X DVD-ROM	Aztech ASC338A	Midtower	384	1	2/3	2	3/1	24	Sat, Sun	BBS, WWW
4X DVD-ROM	Sound Blaster PCI128	Midtower	768	2	4/0	6	4/4	24	Sat, Sun	WWW
6X DVD-ROM	Sound Blaster PCI128	Midtower	768	2	3/1	4	Varies [4]/3	24	Sat, Sun	BBS, WWW
4X DVD-ROM	Sound Blaster PCI128	Midtower	384	2	3/2	4	3/3	24	Sat, Sun	WWW
6X DVD-ROM	Integrated Yamaha DS-XG	Midtower	384	2	3/1	4	Varies [4]/1	24	Sat, Sun	BBS, CIS, WWW
17X-40X	Sound Blaster PCI128	Midtower	768	2	3/1	4	Varies [4]/3	24	Sat, Sun	BBS, WWW
17X-40X	Integrated Yamaha 740 PCI	Midtower	768	2	3/1	2	Varies [4]/3	24	Sat, Sun	BBS, WWW
14X-32X	Sound Blaster AWE64	Midtower	1024	3	3/2	4	Varies [5]/5	24	Sat, Sun	WWW
14X-32X	Integrated Sound Blaster PCI64	Minitower	256	1	1/1	3	3/3	24	Sat, Sun	AOL, BBS, CIS, MSN, WWW
17X-40X	Yamaha 724	Midtower	384	2	3/0	4	3/3	24	Sat, Sun	WWW
14X-32X	Sound Blaster AWE64	Midtower	1024	3	3/2	4	Varies [5]/5	24	Sat, Sun	WWW
14X-40X	Sound Blaster AWE 64D	Midtower	1024	3	3/2	4	3/3	10	None	BBS, WWW
4X DVD-ROM	Sound Blaster PCI128	Midtower	384	4	3/0	3	4/4	24	Sat, Sun	WWW
17X-40X	Sound Blaster Live	Midtower	768	2	2/1	3	Varies [6]/1	24	Sat, Sun	WWW
17X-40X	Turtle Beach Montego II PCI	Midtower	768	2	3/0	4	Varies [4]/1	24	Sat, Sun	WWW
17X-40X	Sound Blaster AWE64	Midtower	768	2	3/2	4	Varies [5]/5	24	Sat, Sun	WWW
4.8X DVD-ROM	Integrated Yamaha YMF7408-V	Minitower	768	2	2/0	3	3/1	24	Sat, Sun	BBS, WWW
14X-32X	Integrated ESS Solo-1 PCI Audio	Minitower	384	2	0/0	2	3/1	24	Sat, Sun	AOL, BBS, CIS, WWW

[3] Also has 512KB level 3 cache.

[4] Five years on CPU and main RAM, three years on other parts.

[5] Six years on CPU and main RAM, three years on other parts.

[6] One year on monitor, three years on other parts.

hundreds of dollars less than most of those competitors.

Like the Entrepreneur KIII-450A, the system's Pentium III-450–based sibling, the KIII-400A packs a Zip drive, a V.90 56-kbps modem, and an ethernet adapter into a spacious case. Inside, it boasts unencumbered access to all components and five available drive bays—two exterior, three interior.

As for its multimedia capabilities, the system's Joy Media Apollo Media 2 3D graphics card maxes out at 1024 by 768 resolution, but its software-based MPEG-2 decoder does a fine job of showing DVD movies at all resolutions and window sizes. The bundled Altec Lansing ACS45.1 speakers will knock you out, especially when the subwoofer kicks in.

CyberMax's support is just adequate. The staff is informative and helpful, but they tended to miss our tough questions, and response times are an issue. The company backs the Entrepreneur with three years of parts coverage and a one-year labor warranty. You can call for toll-free tech support all day, any day, should you encounter a problem.

4 MICRO EXPRESS MICROFLEX-50B

PRO: Swift performance, packed with features

CON: Support technicians could be friendlier

The Micro Express MicroFlex-50B catches our eye with a fast processor and a very nice multimedia setup. It's not the least expensive system you'll find on the budget chart, but it offers great speed and features for the price.

The Pentium III-450 processor boosts the system to an impressive PC WorldBench 98 score of 222; it was barely nosed out by the K6-III-400–powered CyberMax. The system comes with an ATI Rage 128GL graphics card that packs 32MB of RAM—more than any other card we've seen in budget machines. Paired with a 4X DVD-ROM drive, a good 17-inch monitor, and a decent set of Altec Lansing speakers (the ACS 44s), the MicroFlex-50B is one PC that's ready to rock.

Micro Express MicroFlex-50B

Built-in storage is immense; the 18GB hard drive is by far the largest of any ▶

budget system we've seen. You don't get any removable storage, but you can add an internal Zip drive for $100. The system has plenty of space for expansion, with four free external bays and six open PCI slots. They're covered by a very rugged case that's easy to slide open without the use of tools, but drives could be easier to access. Cables are well organized.

Micro Express backs the PC with a long four-year warranty on parts and labor and provides around-the-clock technical support. But in our anonymous calls to the company's support line, we found the representatives abrupt and standoffish.

5 MIDWEST MICRO OFFICE PRO XPO 450

PRO: Outstanding price for a PIII-450 system, 6X DVD-ROM drive

CON: Case is difficult to open

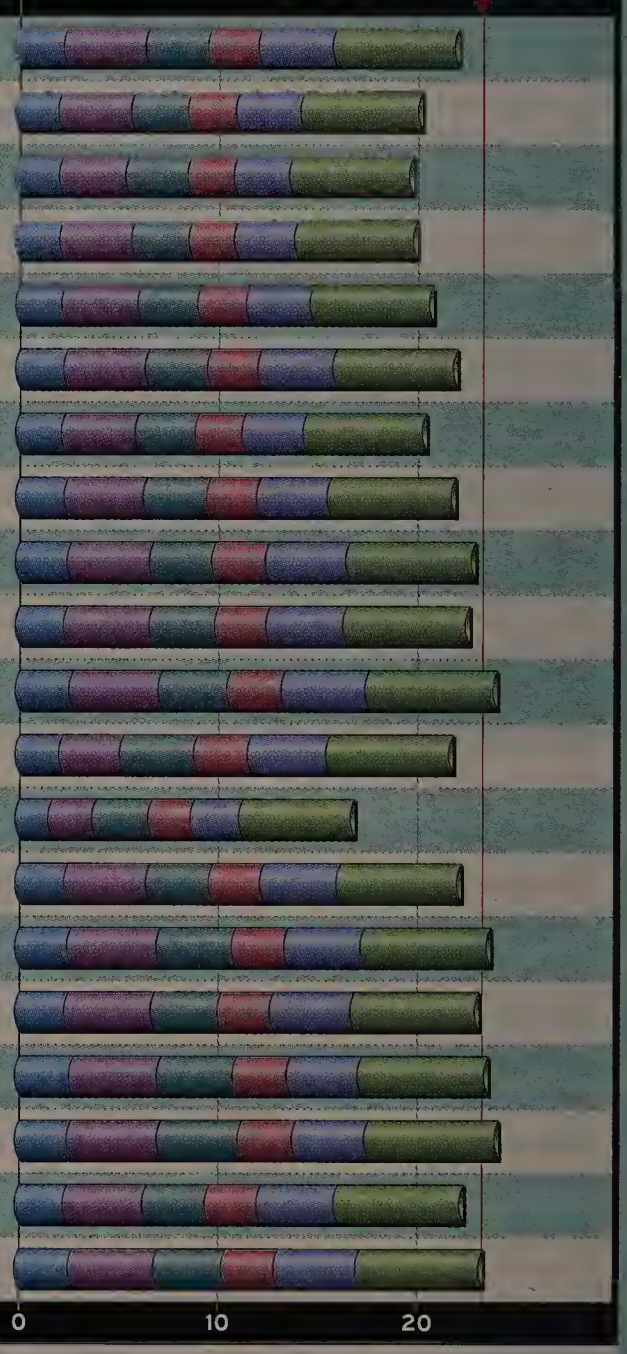
The MidWest Micro Office Pro XPO 450 snags the fifth spot on the chart thanks to its rich collection of features and speedy performance. Aimed at the small-business crowd, the PIII-450–based XPO 450 costs $1349—inexpensive for its class. However, the system tallies a PC WorldBench 98 score of 211, making it the slowest Pentium III-450 machine on our chart (though it's still a good performer for the money).

MidWest Micro Office Pro XPO 450

TOP 20 BUDGET DESKTOPS

TEST REPORT

	SYSTEM	CPU	Operating system	RAM (MB)	Level 2 cache (KB)	PC WorldBench 98 score
1	Quantex M400C*	Celeron-400	Win 98	128	128	198
2	Dell Dimension XPS T450*	Pentium III-450	Win 98	64	512	218
3	CyberMax Entrepreneur KIII-400A*	AMD K6-III-400	Win 98	128	256	223
4	Micro Express MicroFlex-50B*	Pentium III-450	Win 98	64	512	222
5	MidWest Micro Office Pro XPO 450*	Pentium III-450	Win 98	64	512	211
6	Xi Computer 400A MTower	Celeron-400	Win 98	128	128	199
7	Micron Millennia Max 450	Pentium III-450	Win 98	64	512	216
8	MidWest Micro Office Pro 400	Pentium II-400	Win 98	64	512	199
9	MidWest Micro Office MWO-433C	Celeron-433	Win 98	64	128	190
10	Sys Technology TaskMaster Z366C	Celeron-366	Win 98	64	128	193
11	NEC PowerMate VT 300	Celeron-366	Win 98	64	128	181
12	Axis Systems Metropolis NX5-333C	Celeron-333	Win NT 4.0	64	128	198
13	Sys Technology AX-450 P3	Pentium III-450	Win NT 4.0	128	512	266
14	Premio Shadowhawk 400C	Celeron-400	Win 98	128	128	196
15	Micro Express MicroFlex-4C	AMD K6-2-400	Win 98	64	1024	183
16	CompUSA American Pro 366	Celeron-366	Win 98	64	128	188
17	IDot.com 400K6-2	AMD K6-2-400	Win 98	64	1024	184
18	Sys Technology TaskMaster 350K2	AMD K6-2-350	Win 98	64	512	181
19	Acma Exp 6433	Celeron-433	Win 98	64	128	195
20	IBM PC 300 GL, Small Business Series	Pentium II-400	Win 98	64	512	185



*Best Buy

TEST PC WORLD CENTER **HOW WE TEST** All systems are tested with PC World8ench 98, *PC World*'s application-based benchmark. A higher PC World8ench score is better. All PCs are tested with Windows 95, Windows 98, or Windows NT 4.0, and video resolution is set to 800 by 600 in 65,536 colors. We run automated scripts on six popular business applications, performing common tasks such as spelling checks, scrolls, saves, sorts, and recalculations. The PC WorldBench 98 score is a sum of the weighted, normalized result of each script: Word 97 (10 percent), Word Pro 97 (10 percent), Excel 97 (20 percent), 1-2-3 97 (20 percent), Paradox 8.0 (20 percent), and Picture Publisher 7.0 (20 percent). For more details on our benchmark and how we run it, see PC World Online (www.pcworld.com/testing). [1]Under Windows 98 with 128MB of RAM; also includes systems tested in this and previous months that do not currently rank among the Top 20.

MidWest Micro bundles Microsoft Office Small Business Edition—a welcome addition to any business—and a Microsoft Intellimouse, which speeds scrolling through those massive Excel spreadsheets. The case is attached with stiff thumbscrews, but the exterior ports are color coded. Inside, you'll find four open drive bays and four available slots.

The company's warranty covers the CPU and main memory for five years, remaining parts for three years, and labor for three years. MidWest Micro's around-the-clock tech support rates Fair in our anonymous support-quality calls.

New This Month

The following systems made our Budget Desktops chart for the first time this month. For brief reviews of all previously tested machines on the chart, visit PC World Online (www.pcworld.com/top400).

8 MIDWEST MICRO OFFICE PRO 400

PRO: Bargain-basement price, good performance

CON: 15-inch monitor, difficult-to-open case

Aimed at the small-business crowd, the Office Pro 400 sells for $1189—about $200 below average for a PII-400 PC—and delivers a good score of 199 on our PC WorldBench tests.

The system might have ranked higher on our chart, if not for a few drawbacks such as the 15-inch monitor that looked fuzzy in multiple resolutions during our tests. Plus, it took some work to remove and reattach the "tool-less" case cover.

The Office Pro 400 comes with a 10GB hard drive that will suffice for most business users, and tiny but powerful Altec Lansing ACS44 speakers. The PC's generic manual contains a good glossary of technical terms but few specifics about the individual system. MidWest Micro covers the CPU and main memory for five years, and the remaining parts for three years. The vendor offers toll-free 24-hour tech support for the life of the system.

MidWest Micro Office Pro 400

11 NEC POWERMATE VT 300

PRO: Easy-to-open case, excellent display, good support, inexpensive

CON: Relatively slow

NEC targets the PowerMate VT 300 at small and midsize businesses—environments where the machine is likely to fit in well. The system sells for a modest $1249, and delivers a PC WorldBench 98 score of 181. While that score is average for a Celeron-366 system, it nears the bottom of the pack when compared with the scores of all machines on the budget chart.

NEC PowerMate VT 300

The PowerMate VT 300's case proves accessible and easy to open—just loosen a few thumbscrews to get inside. The company makes setting up the PC painless, thanks to a well-designed chart, color-coding of cables, and labeled connectors in the back.

NEC's crystal-clear 17-inch monitor displays sharp text and graphics, even at high resolutions of 1280 by 1024. The system's default configuration doesn't include a modem or an ethernet card, but you can add either device for $50. For our test computer, we specified a network interface card, to make the system comparable with others on the chart.

The company backs the PowerMate with a warranty of three years for both parts and labor, and its support technicians are available around the clock. In our anonymous calls, we were pleased by the reps' knowledgeable responses on everything from FAT32 to screen savers.

13 SYS TECHNOLOGY AX-450 P3

PRO: Good performance, great warranty, network card, remote management

CON: High price for a budget PC, no system manual, mediocre support quality

At $1799, Sys's AX-450 P3 makes an expensive budget choice. But its PC WorldBench 98 score of 266 rivals those of systems on the power chart, and it's the lowest-priced PIII-450 machine we've seen running Windows NT 4.0.

The system comes with a network card, chassis-intrusion safeguards, Wake-on-LAN, and LANDesk hardware monitoring—all well-suited to corporate environments. In addition to providing management features, Sys includes an industry-standard 3Com network interface card—handy for adding the PC to a company's local area network.

The AX-450 P3 comes equipped with a high-quality 17-inch monitor that displays clear text and graphics. In our tests, even small text in Excel and Word appeared sharp at 1600 by 1200 resolution.

The system offers loads of expansion options, including two open bays for adding a CD-ROM drive, a DVD-ROM drive, or a tape backup device, as well as one open floppy bay—in case you want to add a Zip drive. Adding peripherals won't pose any problems, either: You'll find three open PCI slots and one open ISA slot in the machine.

And Sys doesn't overlook its input device offering. The AX-450 P3 comes with a quiet, solid-feeling keyboard, and a mouse with two-axis scrolling.

Unfortunately, the company does miss on some other details. Our test machine came with manuals only for peripherals, not for the overall system. This deficiency means that you'll be troubleshooting any problems you encounter on your own.

Sys Technology AX-450 P3

As some compensation, Sys backs the AX-450 P3 with a warranty that's one of the best we've seen, including six years for the CPU and main RAM and five years for labor. The company offers free, around-the-clock support for as long as you own the computer. In our anonymous support calls, however, technicians gave us varying levels of useful advice. ▶

BEYOND THE TOP 20

online

We evaluated the following systems along with the others, but they didn't score high enough to reach the *Top 20 Budget Desktops* chart. For write-ups, visit PC World Online (www.pcworld.com/t20pcs).

- **AES Tech Winchip 300 Workstation**
- **CTX Nu-Topia TIK 450**

PC WORLD

TOP 10 NOTEBOOK PCs

	POWER NOTEBOOK	Last month	Month tested	Street price (5/7/99)	CPU	Comments
1	Dell Inspiron 7000 A366LT 800/388-8542 www.dell.com	3	Apr 99	$3193	Pentium II-366	Speedy but huge model with 15-inch screen gets $102 price cut.
2	Gateway Solo 5150LS 800/315-2536 www.gateway.com	2	Apr 99	$3249	Pentium II-366	Desktop replacement sports a big 14.1-inch screen and a DVD-ROM drive.
3	Dell Latitude CPi A366XT 800/388-8542 www.dell.com	1	May 99	$3098	Pentium II-366	Thin, well-designed corporate laptop; great vendor reliability rating; no modem.
4	Fujitsu LifeBook E360 888/466-8434 www.fujitsu-pc.com	n/a	NEW	$2599	Pentium II-333	Inexpensive, with many multipurpose bay options and a unique pointing device.
5	Gateway Solo 9150LS 800/315-2536 www.gateway.com	4	July 99	$3599	Pentium II-366	Comparable to number-one Dell Inspiron, but a tad lighter and more expensive.
	BUDGET NOTEBOOK					
1	Gateway Solo 2500SE 800/315-2536 www.gateway.com	2	June 99	$1899	Pentium II-300PE	$245 price cut, zippy speed, and unmatched battery life put this notebook on top.
2	HP OmniBook XE2 888/322-4772 www.hp.com	3	July 99	$1899	Celeron-333	Compact, speedy portable includes pleasing audio features.
3	Chem USA ChemBook 7200 800/866-2436 www.chemusa.com	n/a	NEW	$1469	Celeron-333	Won't win a design contest, but great price and power features.
4	Micron TransPort Trek2 888/634-8799 www.micronpc.com	n/a	NEW	$2099	Celeron-333	Fastest and heaviest notebook on budget chart suitable as your primary PC.
5	Compaq Armada 1500c 800/345-1518 www.compaq.com	5	July 99	$1799	Celeron-300	A not-too-fancy desktop replacement model with top-notch audio.

Best Buy See features chart, page 234.

n/a = not applicable

[1]Includes computer; adapter; power cord; and floppy, DVD-ROM, or CD-ROM drive.

[2]For more about products here, select the number on the product information card or visit www.pcworld.com/productinfo.

ARE YOU HIP TO DVD—or even want to be? Almost all notebook vendors now offer models equipped with next-generation DVD-ROM players whose 4.7GB discs hold seven times the capacity of a CD-ROM. Unfortunately, a dearth of business applications on DVD-ROM makes the option too extravagant for most companies that outfit their employees with portable PCs.

Right now movie watching and gaming are about the only uses for a DVD-ROM drive on a laptop. But as prices of built-in DVD-ROM drives drop to as low as $150, buying a notebook with one becomes a reasonable investment. Then when a killer DVD app comes along, you'll be ready.

DVD-ROM drives used for movie watching require an MPEG-2 decoder. Until recently, the picture quality offered by software decoders lagged noticeably behind the image quality produced by hardware decoders. But today's faster processors, such as the Celeron-333, significantly improve playback from software decoders, which are easier to upgrade than hardware alternatives.

MOST FLEXIBLE NOTEBOOK

OF THE EIGHT NEW notebooks we tested this month, three made the grade. Fujitsu's $2599 LifeBook E360 debuts as the least expensive laptop on our power chart; the model's two multipurpose bays also make it the most configurable.

On the budget side, don't let the ChemBook 7200's cheesy appearance fool you: Weighing in at a light 6.9 pounds, this number-three portable packs some nice surprises for a $1469 notebook, such as an easy-to-use keyboard. Lastly, Micron's TransPort Trek2, powered by Intel's Celeron-333 processor, offers hot performance and desktop replacement possibilities for just over $2000.

This Month's Best Buys

POWER NOTEBOOKS

1 DELL INSPIRON 7000 A366LT

PRO: Fastest notebook we've tested, panoramic screen, huge hard drive, DVD-ROM drive

CON: Heavy, poor audio

A $102 price drop puts this heavy and full-featured desktop replacement in the driver's seat. Tipping the scales at 10.4 pounds (including AC adapter) and measuring 12.9 inches wide, 10 inches deep, and 2.2 inches thick, the Inspiron 7000 A366LT is one of the chunkiest notebooks we've evaluated: It throws in everything except the kitchen sink, but you won't want to lug it around on many long trips. Nonetheless, you can't beat its combination of computing

The Inspiron 7000 A366LT has a stacked media drive.

SCORECARD

★ Overall rating	PC WorldBench 9B score/performance	Price	Vendor's system reliability	Features and design	Vendor's support quality/policies	Battery life (hours:min)/rating	Traveling weight [1]	Product info number [2]
86	191/Outstanding	Average	Outstanding	Very good	Good/Fair	3:24/Good	Very heavy	–
86	186/Very good	Expensive	Good	Very good	Good/Good	2:50/Good	Average	666
86	184/Very good	Average	Outstanding	Good	Good/Outstanding	2:15/Satisfactory	Light	–
84	176/Very good	Inexpensive	Good	Very good	Good/Fair	2:25/Satisfactory	Average	667
84	188/Very good	Very expensive	Good	Very good	Good/Good	3:17/Good	Very heavy	668
Power scorecard weightings ▶	Performance 22 percent	Price 14 percent	Reliability 22 percent	Features 16 percent	Support 10 percent	Battery life 8 percent	Weight 8 percent	
90	165/Outstanding	Average	Good	Very good	Good/Good	5:08/Outstanding	Average	669
85	166/Outstanding	Average	Good	Very good	Good [3]/Poor	2:36/Satisfactory	Average	670
84	165/Outstanding	Inexpensive	[4]	Satisfactory	Adequate [3]/Fair	3:20/Good	Light	671
82	170/Outstanding	Expensive	Good	Good	Good/Fair	2:09/Poor	Heavy	672
81	150/Very good	Average	Fair	Good	Fair/Fair	2:16/Satisfactory	Average	673
Budget scorecard weightings ▶	Performance 14 percent	Price 22 percent	Reliability 22 percent	Features 16 percent	Support 10 percent	Battery life 8 percent	Weight 8 percent	All products: 902

[3] Due to insufficient data from survey, score is based on responses to anonymous calls for tech support.

[4] Insufficient data to give a rating.

speed, desktop comfort, and battery life.

Intel's next-fastest mobile processor and 256KB of onboard level 2 cache helped the A366LT earn a PC WorldBench 98 score of 191, the highest we've recorded for a PII-366 notebook equipped with 64MB of RAM. (Quantex's H-1410, with 128MB of RAM, also scored 191.) With a beautiful 15-inch screen, a comfortable keyboard, and a 10GB hard drive, the A366LT makes an ideal primary PC, especially when teamed with Dell's optional $149 port replicator.

Like many of today's top-of-the-line notebooks, the A366LT also offers a modular bay that can accommodate any one of several devices. In place of the DVD-ROM drive and floppy drive, which come stacked in a combined module, you can insert a second battery ($119) or an Iomega Zip drive ($139). Order a combo CD-ROM/floppy drive in place of the DVD-ROM drive and you save $199.

Unless you make a lot of transcontinental flights, the A366LT's 3.3-hour battery life—the best on this month's power chart—should offer plenty of endurance. Our only caveat: If you plan to use this notebook's TV-out jack for watching DVD movies, editing video, or making big-screen presentations, buy a set of external stereo speakers. Despite its size, the 7000 suffers from weak built-in audio.

BUDGET NOTEBOOKS

1 GATEWAY SOLO 2500SE

PRO: Super battery life, good performance, generous software bundle

CON: Boxy appearance, on the heavy side

With Dell's Inspiron 3500 C300-XT discontinued, this boxy 8-pound notebook with built-in CD-ROM and floppy drives becomes our new budget Best Buy. The Gateway Solo 2500SE offers fast performance, expandability, and an incredible five hours of battery life on a single charge. It's a terrific choice for business and home users, especially after this month's $245 price drop.

The Solo 2500SE earns performance scores similar to those of a Pentium II-300 notebook. It's about 10 percent slower than a typical Pentium II-366—but that's not bad considering it costs more than $1000 less than a PII-366.

Gateway Solo 2500SE

Gateway appeals to the home crowd by including a TV-out jack, headphones, and a clutch of Microsoft home-office applications including Money, Home Essentials, Encarta Encyclopedia (all '98 editions), and Microsoft Greetings Workshop.

Gateway also offers a couple of nice configuration options for this all-in-one model: You can opt for an eraserhead pointing device instead of the standard touchpad. You can also ditch the standard floppy drive for a fixed SuperDisk LS-120 removable-media drive ($75 extra), or the CD-ROM drive for a DVD-ROM drive (for an additional $150). If you plan to use the 2500SE as your primary PC, you'll need the optional $99 port replicator. ▶

PHOTOGRAPHS: KEN SMITH

TOP 10 NOTEBOOK PCs

STANDARD FEATURES

	POWER NOTEBOOK	CPU	Traveling weight (pounds)[1]	RAM (MB)	Hard drive (GB)	Color screen type	Screen diagonal (inches)	Screen resolution	Maximum screen colors	Battery type	Pointing device
1	Dell Inspiron 7000 A366LT*	Pentium II-366	10.4	64	10	Active	15	1024 x 768	16.8 million	Lithium ion	Touchpad
2	Gateway Solo 5150LS	Pentium II-366	7.7	64	6.4	Active	14.1	1024 x 768	16.8 million	Lithium ion	Touchpad
3	Dell Latitude CPi A366XT	Pentium II-366	7	64	6.4	Active	13.3	1024 x 768	16.8 million	Lithium ion	Touchpad
4	Fujitsu LifeBook E360	Pentium II-333	8.2	64	6.4	Active	13.3	1024 x 768	16.8 million	Lithium ion	Eraserhead
5	Gateway Solo 9150LS	Pentium II-366	9.8	128	10	Active	15	1024 x 768	16.8 million	Lithium ion	Touchpad
	BUDGET NOTEBOOK										
1	Gateway Solo 2500SE*	Pentium II-300PE	8	64	4	Active	12.1	800 x 600	262,144	Lithium ion	Touchpad
2	HP OmniBook XE2	Celeron-333	7.5	64	4	Active	12.1	800 x 600	16.8 million	Lithium ion	Touchpad
3	Chem USA ChemBook 7200	Celeron-333	6.9	64	4.8	Active	12.1	800 x 600	16.8 million	Lithium ion	Touchpad
4	Micron TransPort Trek2	Celeron-333	8.9	64	4.3	Active	14.1	1024 x 768	65,536	Lithium ion	Touchpad, eraserhead
5	Compaq Armada 1500c	Celeron-300	7.8	32	4	Active	12.1	800 x 600	16.8 million	NiMH	Touchpad

*Best Buy ● Yes ○ No

[1]Includes computer; adapter; power cord; and floppy, DVD-ROM, or CD-ROM drive.

[2]Free tech support ends after three years.

New This Month

POWER NOTEBOOKS

4 FUJITSU LIFEBOOK E360

PRO: Two modular bays, helpful documentation, attractive bluish-gray case

CON: Hard-to-use pointing device, mediocre battery life and support policies

Fujitsu's E line of LifeBooks reigns supreme in configurability. No other notebook line—not even NEC's trailblazing Versa—offers as many mix-and-match drive and battery options.

The $2599 E360 comes with two modular bays, both located in the front of the notebook. The left bay accepts the included floppy drive, and the right bay will take any one of a full range of extra-cost devices: DVD-ROM drive ($499), LS-120 removable-media drive ($229), Iomega Zip drive ($269), or a second hard drive ($899 for 5GB). Either bay will hold the included battery ($249 for a second battery), an unusually flexible arrangement offered by few other notebook manufacturers.

Frequent travelers may like the empty spaceholder module, which lets you shave half a pound off the notebook's traveling weight of 8.2 pounds. But wait, there's more, particularly for heavy multitaskers: A dedicated floppy drive port lets you simultaneously use the drive, print from the parallel port, and access two other devices in the modular bays.

So what's not to like about this good-looking, highly configurable portable? Fujitsu's admirable attempt at designing a unique pointing device falls a little flat with the ErgoTrac, a big, round, rocking button that replaces the traditional touchpad. Few users will want to adapt to yet another tricky pointing device, particularly an unusual one like the ErgoTrac, which takes some time to get used to.

Fujitsu LifeBook E360

The E360's 2.3-hour battery life is just okay compared with other notebooks on the chart. Fujitsu's recent slashing of standard parts and labor warranties on the E series line from three years to one is disappointing, especially since it's one of the few notebook vendors to cut off free technical support after three years (you'll then have to pay $89 per year). Still, the company's tech support may be worth paying for; judging from the service we got in our anonymous calls, it's pretty good. Finally, the E360 comes with a great manual.

BUDGET NOTEBOOKS

3 CHEM USA CHEMBOOK 7200

PRO: Good price, speed, and keyboard

CON: Cheap-looking case, no docking option

You can't judge a notebook by its cover—especially not the ChemBook 7200, a nice budget machine saddled by an unattractive silver case. At $1469, this fast Celeron-333 laptop boasts the lowest price on the chart, yet still offers a few extras.

For starters, the ChemBook's 6.9-pound weight (including AC adapter) is impressively light for a notebook equipped with a built-in floppy drive, CD-ROM drive, and modem. And if you like soft, quiet keyboards, you'll appreciate the ChemBook 7200's uncanny impersonation of the IBM ThinkPad's keyboard, known for its understated comfort. The bundled Alps utility lets you do everything from using the mouse buttons for launching applications to assigning whimsical sound effects to the touchpad.

The ChemBook 7200 offers a comfy keyboard.

With all that's bundled in, the ChemBook 7200 doesn't offer many expansion options or let you attach a docking

		EXPANDABILITY					CUSTOMER SUPPORT			
CD/DVD-ROM drive speed	56-kbps modem protocol	Maximum RAM (MB)	Modular expansion bays	Bay for second battery	Optional docking station	Infrared port	Warranty for parts/labor (years)	Weekday toll-free support (hours)	Weekend support	Online support
2X DVD-ROM	V.90	192	2	●	●	●	3/3	24	Sat, Sun	BBS, WWW
2X DVD-ROM	V.90	288	1	○	●	●	3/3	24	Sat, Sun	AOL, BBS, CIS, WWW
10X-24X	Not included	256	1	●	●	●	3/3	24	Sat, Sun	AOL, BBS, CIS, WWW
20X-24X	V.90	192	2	●	●	●	1/1	24 [2]	Sat, Sun	WWW
2X DVD-ROM	V.90	384	1	●	●	●	3/3	24	Sat, Sun	AOL, BBS, CIS, WWW
8X-20X	V.90	288	0	○	●	●	3/3	24	Sat, Sun	AOL, BBS, CIS, WWW
12X-24X	V.90	256	0	○	●	●	1/1	24	Sat, Sun	AOL, BBS, CIS
10X-24X	V.90	160	0	○	○	●	1/3	24 [3]	Sat, Sun	WWW
12X-24X	V.90	256	2	○	○	●	3/3	24	Sat, Sun	BBS, CIS, WWW
12X-24X	V.90	160	1	●	●	○	1/1	24	Sat, Sun	AOL, BBS, CIS, WWW

[3] Tech support line is not toll-free.

station or port replicator, limiting its desirability as a primary PC. Audio sounds predictably weak, and the ChemBook's 12.1-inch screen looks a bit passé.

But to its credit, the ChemBook offers generous battery life—running a respectable 3 hours and 20 minutes on a single charge. Unlike some $3000 competitors, this model also sports easily upgradable components, including memory and a 4.8GB hard drive. (Chem USA says a DVD-ROM laptop will soon be available for an extra $200.)

The 7200's basic but nicely laid-out manual with pencil illustrations was a pleasant surprise. Unlike most small notebook vendors, Chem USA offers around-the-clock and weekend support. However, users foot the cost of a long-distance call. The quality of advice could be a little better, too. One rep tried to sell us more hardware rather than solve our driver problem.

4 MICRON TRANSPORT TREK2

PRO: AGP bus, two USB ports, lots of video and audio connections, comfortable keyboard

CON: Heavy, poor battery life

If you shy away from budget notebooks with alternative processors like AMD's but don't want to pay for a Pentium II, check out a Celeron-based laptop. Notebooks with Intel's latest budget processor have proved their mettle as inexpensive alternatives to Pentium II portables.

A case in point: Micron's $3199 TransPort Trek2 AGP, a PII-366 model we reviewed in June, was too expensive to make our chart. This month, a slightly slower but dramatically cheaper $2099 Celeron-333 version of virtually the same notebook earns a place on the budget list.

Micron TransPort Trek2

A big, black, boxy portable weighing almost 9 pounds including its AC adapter, the Trek2 doesn't offer much flexibility. In place of the CD-ROM drive, you can insert a second hard drive ($299 for 4.3GB) but nothing more. Still, this unit improves over the version we tested in June by providing user-upgradable RAM, an LS-120 removable-media drive instead of a floppy drive, and a stick pointing device in addition to the touchpad.

Separate in and out ports let you hook up multiple devices for recording and playing sound. And if you need an even bigger screen, the TransPort's S-video-out jack lets you watch DVD movies on a TV.

The Celeron-333 Trek2 does demand a couple of trade-offs. This TransPort performs 9 percent slower than its PII-366 sibling, but it's the fastest of the four Celeron-333 notebooks we've tested. Alas, the Trek2's battery life shrinks from almost 3 hours (on the PII-366 model) to a little more than 2, the worst battery life rating on the Top 10 chart. Nevertheless, users who tend to make short trips may be willing to overlook this shortcoming.

In our last survey, *PC World* readers praised Micron's toll-free support. In our own anonymous technical support calls, we've gotten through to reps more easily lately than in the past. The quality of advice still varies considerably, however.

—Carla Thornton

Contributing Editor Carla Thornton writes regularly about notebooks. ■

BEYOND THE TOP 10

online

We tested five other portables this month, but they didn't score high enough to make the *Top 10 Notebook PCs* chart. For reviews, visit PC World Online (www.pcworld.com/top400).

- **AMS Tech Roadster 15CTA380**
- **AMS Tech Roadster 21CXD400**
- **Micron TransPort NX**
- **NEC Versa LX**
- **Sony VAIO PCG-F180**

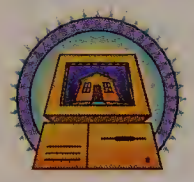
PC WORLD

TOP 10 HOME PCs

	POWER SYSTEM	Last month	Month tested	Street price (5/7/99)	Comments
1	Dell Dimension XPS T550 800/388-8542 www.dell.com	n/a	NEW	$2619	**PRO:** Fastest home system to date, Zip drive, great audio, very expandable; only vendor to earn Outstanding support rating for its home machines. **CON:** Short on bundled software.
2	Quantex SM550 SE 800/896-4898 www.quantex.com	n/a	NEW	$2549	**PRO:** Very fast, terrific speakers, comes with Microsoft Natural Keyboard and tons of storage including Sony CD-RW and Zip drives. **CON:** Monitor blurry on small text, poor setup manuals.
3	Micron Millennia Max 500 888/634-8799 www.micronpc.com	n/a	NEW	$2475	**PRO:** Great performance (nearly as fast as a PIII-550), innovative case design, very expandable. **CON:** Limited documentation for novices.
4	Sony VAIO Digital Studio PCV-R528DS 888/476-6972 www.sony.com/pc	n/a	NEW	$2700	**PRO:** Software and hardware extras for digital imaging and multimedia, improved sound system. **CON:** Priciest PC here, small hard drive considering the digital video features.
5	Gateway Performance 500 800/315-2536 www.gateway.com	2	Apr 99	$2229	**PRO:** Lowest-priced power system here, outstanding sound. **CON:** Half the memory of other power models here, mediocre software package.
	BUDGET SYSTEM				
1	Micron Millennia C433 888/634-8799 www.micronpc.com	4	June 99	$1314	**PRO:** Fastest budget machine yet, excellent 3D performance, good price after recent $261 drop. **CON:** None significant.
2	Quantex M333c 800/896-4898 www.quantex.com	2	Feb 99	$899	**PRO:** Superlow price, good speed for basic tasks. **CON:** Connectors not clearly labeled for setup, aging Celeron machine.
3	Gateway Essential 400c 800/315-2536 www.gateway.com	3	June 99	$1453	**PRO:** Swift performance, high-quality monitor, easily expandable, recent $79 price reduction, comes with Epson Stylus Color 440 printer. **CON:** Middling rating for vendor's system reliability.
4	IBM Aptiva E Series 240 800/426-7235 ext. 4340 www.ibm.com/aptiva	5	June 99	$1098	**PRO:** Great price ($100 off this month), includes microphone headset; faster than most systems with same processor. **CON:** Limited expandability, mediocre support rating.
5	Gateway Select 450 800/315-2536 www.gateway.com	n/a	NEW	$1408	**PRO:** Good buy includes Epson Stylus Color 440 printer; pleasing graphics performance for a budget PC. **CON:** Slower than 400-MHz Essential 400c, vendor's system reliability rating not great.

Best Buy n/a = not applicable

[1] For more about products here, select the number on the product information card or visit www.pcworld.com/productinfo.



THE SPEEDIEST MACHINES demand top dollar. But why should you invest two or three grand in a PC equivalent of a Triple Crown thoroughbred when you can buy a perfectly serviceable workhorse for less than a thousand bucks? Possible answers: You want a hedge against inflation; you love games and graphics, so you need speed; or you want the best "because it's there."

Whatever your reason, this month's Top 10 includes a high-performance system for you. New PCs from Dell, Micron, Quantex, and Sony sweep onto our power list. The Dell and Quantex machines are the first we've seen with a Pentium III-550 chip. Both offer unrivaled speed—about 4 percent faster than the previous champ, Dell's Dimension XPS T500.

On the budget chart, Micron's Millennia C433 ascends to the Best Buy slot. (At press time, Micron replaced the C433 with a Celeron-466 model that costs $59 more.) Meanwhile, Gateway cracks the list with its new Select 450—the company's first non-Intel–based PC that uses AMD's K6-2-450 processor. At number five, it finishes two spots behind its Celeron-400–based sibling, the Essential 400c.

At $1408, the Select 450 costs $45 less than the Essential 400c, yet it has more RAM and a bigger hard disk. But if you want a DVD-ROM drive and slightly faster performance, go for the Essential 400c.

THE WINNER'S CIRCLE

THIS MONTH, three new power systems break the speed record for home PCs: Dell's Dimension XPS T550 steals the Best Buy spot, Quantex's new SM550 SE becomes number two, and Micron's Millennia Max 500 steps into third place. All three deliver breakneck performance and provide lots of storage and expandability, making them outstanding small-business or home-office PCs that will remain useful well into the future.

Dell's Dimension XPS T550 earns the highest PC WorldBench 98 rating we've ever seen in this Top 10. Its eye-boggling score of 241 represents a 10-point jump over the former speed leader. And its Diamond Viper V770 graphics card also delivers fast frame rates in games.

Dell Dimension XPS T550

If you need to store tons of data, you'll also appreciate the XPS T550's 20GB hard drive and Zip drive. Plus, you can add more components: An easy-off panel provides quick access to three available PCI slots and three open drive bays.

Meanwhile, the second-place Quantex SM550 SE has merits of its own. Though the Dell PC runs a smidgen faster than the Quantex, the SM550 SE costs $70 less and comes with a Microsoft Natural Keyboard and Sony's CD-RW drive—which

SCORECARD

★ Overall rating	PC WorldBench 98 score/rating	Price	Setup/ ease of use	Graphics	Reliability/ support	Features	Product info number
95	241/Outstanding	Expensive	Outstanding/ Outstanding	Very good	Good/ Outstanding	Pentium III-550, 128MB of SDRAM, 20GB hard drive, 4.8X DVD-ROM drive, V.90 56-kbps modem, 19-inch monitor, Zip drive, Altec Lansing speakers.	–
90	239/Outstanding	Expensive	Good/ Good	Very good	Good/ Good	Pentium III-550, 128MB of SDRAM, 17GB hard drive, 4X DVD-ROM drive, V.90 modem, 19-inch monitor, CD-RW drive, Zip drive, Altec Lansing speakers.	692
90	236/Outstanding	Average	Good/ Very good	Very good	Good/ Good	Pentium III-500, 128M8 of SDRAM, 17G8 hard drive, 4X DVD-ROM drive, V.90 56-kbps modem, 17-inch monitor, Monsoon flat-panel speakers.	693
88	219/Good	Expensive	Outstanding/ Good	Outstanding	Good/ Fair	Pentium III-500, 128MB of SDRAM, 13GB hard drive, 4X DVD-ROM drive, V.90 56-kbps modem, 17-inch monitor, Sony CD-RW drive, SRS-Z05DV speakers.	694
86	229/Very good	Average	Outstanding/ Very good	Outstanding	Fair/ Good	Pentium III-500, 64MB of RAM, 13.6G8 hard drive, 4.8X DVD-ROM drive, V.90 56-kbps modem, 19-inch monitor, 8oston Acoustics 8A635 speakers.	695
Power scorecard weightings ▶	Performance 20 percent	Price 10 percent	Setup/ease 5 percent	Graphics 10 percent	R & S 40 percent	Features 15 percent	
77	206/Outstanding	Average	Good/ Very good	Very good	Good/ Good	Celeron-433, 64MB of SDRAM, 13GB hard drive, 4.8X DVD-ROM drive, V.90 56-kbps modem, 17-inch monitor, Advent AV0D9 speakers and subwoofer.	696
76	169/Very good	Very inexpensive	Good/ Good	Good	Good/ Good	Celeron-333, 64MB of SDRAM, 4GB hard drive, 12X-32X CD-ROM drive, V.90 56-kbps modem, 15-inch monitor.	697
74	193/Outstanding	Expensive	Outstanding/ Very good	Good	Fair/ Good	Celeron-400, 64MB of SDRAM, 10GB hard drive, 4.8X DVD-ROM drive, V.90 56-kbps modem, 17-inch monitor, Boston Acoustics BA635 speakers.	698
74	173/Very good	Inexpensive	Very good/ Good	Good	Good/ Fair	AMD K6-2-350, 64MB of SDRAM, 6.4G8 hard drive, 14X-32X CD-ROM drive, V.90 56-kbps modem, 15-inch monitor, IBM Infinity speakers.	–
73	184/Outstanding	Expensive	Outstanding/ Very good	Very good	Fair/ Good	AMD K6-2-450, 96MB of SDRAM, 13GB hard drive, 12X-32X CD-ROM drive, V.90 56-kbps modem, 17-inch monitor, Altec Lansing GSC100 speakers.	699
Budget scorecard weightings ▶	Performance 15 percent	Price 25 percent	Setup/ease 10 percent	Graphics 5 percent	R & S 40 percent	Features 5 percent	All products: 904

makes it great for archiving as well as for storing massive multimedia files.

The SM550 SE is easily expandable, too, with four available drive bays, two free ISA slots, but only one open PCI slot.

Another rung lower on the price ladder is Micron's speedy Millennia Max 500. Despite its 50-MHz speed deficit compared to the Dell and Quantex systems, the Max 500 achieved a PC WorldBench 98 score of 236, putting it within two percentage points of the Dell and within a percentage point of the Quantex.

The Millennia Max 500 also invites future expansion. Removing the easy-off cover exposes a plastic door with nooks that look as though they were designed to hold airline liquor bottles. At first glance, the door seems to block access to slots and drive bays, but fortunately it just controls airflow. Inside you'll find three free PCI slots and five empty drive bays. The bays are covered by a plastic door on the front of the computer that folds down like a drawbridge or cup holder.

Gateway Select 450

Other nice touches include a keyboard with programmable buttons that are ergonomically situated between the main keys and the number pad, and a pair of Monsoon flat-panel speakers that produce terrific sound and occupy a minimum of desktop real estate.

MULTIMEDIA CONTENDER

IF YOU'RE PASSIONATE about making movies, this month's fourth-ranked power system, Sony's VAIO Digital Studio PCV-R528DS, has the right stuff. We shot over an hour of digital video and easily downloaded it via the I-Link (Sony's name for the IEEE 1394 standard) port on the front of the case. Sony's easy-to-use DV Gate software combines downloading with an initial round of editing, which saves time and disk space. The bundled Adobe Premier has more advanced and complex editing tools, but is still fun to use.

Aside from its video capabilities, the PCV-R528DS improves upon some of the features of its older sibling, the PCV-E518DS: The new Digital Studio is more expandable, with two open PCI slots instead of just one. And instead of a pair of mediocre speakers built into the monitor, you get free-standing speakers.

Nevertheless, despite Sony's hardware enhancements, the PCV-R528DS pulled in a PC WorldBench 98 score of just 219, substantially lower than those of the other power PCs on our chart. —*Kirk Steers*

Oakland, California, writer Kirk Steers is a contributing editor for PC World. ■

BEYOND THE TOP 10

online

We also evaluated the following systems this month, but they did not score high enough to make the *Top 10 Home PCs* list. For write-ups, see PC World Online (www.pcworld.com/t10homepcs).

- **ABS Rio Value PIII 450**
- **Axis Orion 100R DVD**
- **NEC Ready 9946**

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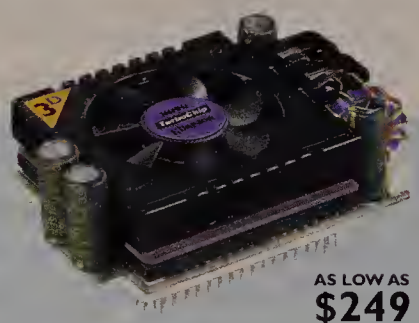

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PC WORLD

TOP 10 PRINTERS

	SMALL-BUSINESS/HOME COLOR	Street price (5/5/99)	Overall rating	Speed for plain text/full-page graphics (ppm)	Print quality for text/color graphics	Comments	Product info number
1	Epson Stylus Photo 700 800/463-7766 www.epson.com	$249	86	1.3/0.4	adequate/ good	FEATURES: Ink jet, speed unrated. 1440-by-720-dpi maximum resolution, 100 sheets input, 30 output. SUMMARY: Our reigning number one offers good graphics print quality on plain paper—and outstanding quality on specialty media—but text speed is particularly slow. Includes a strong photo-oriented software bundle.	–
2	Lexmark 3200 Color Jetprinter 800/539-6275 www.lexmark.com	$179	85	2.1/0.4	good/ good	FEATURES: Ink jet, rated 6 ppm monochrome/2.5 ppm color. 1200-by-1200-dpi maximum resolution, 100 sheets input, 25 output. SUMMARY: Solid print quality for a reasonable price, but performance is somewhat slow and the design could be sturdier. The number four 5700 Color Jetprinter has more features but costs $50 more.	712
3	HP DeskJet 882C 800/752-0900 www.hp.com	$299	84	4.3/0.8	good/ good	FEATURES: Ink jet, rated 5 ppm monochrome/2 ppm color. 600-by-600-dpi resolution (maximum resolution unrated), 100 sheets input, 50 output. SUMMARY: Impressive print quality on both text and graphics; fastest speeds on the SOHO chart, but somewhat high price keeps it from the top spot.	713
4	Lexmark 5700 Color Jetprinter 800/539-6275 www.lexmark.com	$229	84	2.9/0.3	good/ good	FEATURES: Ink jet, rated 8 ppm monochrome/4 ppm color. 1200-by-1200-dpi maximum resolution, 100 sheets input, 25 output. SUMMARY: Faster on text than either Best Buy but a bit slower on graphics, this sturdy model delivers high-quality output across the board. More comprehensive features than the number two 3200 Color Jetprinter.	714
5	Epson Stylus Color 440 800/463-7766 www.epson.com	$129	81	2/0.6	good/ adequate	FEATURES: Ink jet, rated 4 ppm monochrome/2.5 ppm color. 720-by-720-dpi maximum resolution, 100 sheets input, 30 output. SUMMARY: The cheapest on the chart, this model prints text more slowly than most, but with good quality. Graphics output could be better, though speed is good for such an inexpensive printer.	–
6	Xerox DocuPrint C20 800/349-3769 www.xerox.com	$699	80	2.7/0.3	good/ good	FEATURES: Ink jet, rated 8 ppm monochrome/4 ppm color. 1200-by-1200-dpi maximum resolution, 150 sheets input, 50 output. SUMMARY: A $100 price drop puts this tabloid-format model on the chart for the first time, bumping the Epson Stylus Color 1520. Good print quality overall, but installation can be tough. Highest price on SOHO chart.	715
7	Canon BJC-6000 800/652-2666 www.ccsi.canon.com	$249	80	4.6/0.9	very good/ adequate	FEATURES: Ink jet, rated 8 ppm monochrome/5 ppm color. 1440-by-720-dpi maximum resolution, 130 sheets input and output. SUMMARY: This quick, reasonably priced ink jet makes the SOHO chart for the first time with strong text print quality and optional networking. Its graphics could be better, though.	716
	CORPORATE COLOR						
1	Tektronix Phaser 740/N 800/835-6100 www.tektronix.com	$1850	89	8.9/0.5	good/ adequate	FEATURES: Laser, rated 16 ppm monochrome/5 ppm color. Standard 32MB of RAM, 1200-by-1200-dpi maximum monochrome/600-by-600-dpi maximum color resolution, 350 sheets input, 500 output. SUMMARY: You can upgrade this quick, cheap laser to include even more features. Strong text quality, but graphics output can be inconsistent.	717
2	Tally T8104 800/843-1347 www.tally.com	$1799	87	9.8/0.5	good/ good	FEATURES: Laser, rated 16 ppm monochrome/8 ppm color. Standard 24MB of RAM, 1200-by-600-dpi maximum resolutions, 250 sheets input and output. SUMMARY: In addition to being the cheapest model on the corporate chart, the Tally offers the fastest text speed and good overall print quality.	718
3	Lexmark Optra SC 1275 800/539-6275 www.lexmark.com	$1899	87	7.5/0.5	good/ good	FEATURES: Laser, rated 12 ppm monochrome/3 ppm color. Standard 16MB of RAM, 600-by-600-dpi maximum resolutions, 400 sheets input, 250 output. SUMMARY: This great choice for busy offices features strong print speeds, extensive paper-handling options, good all-around print quality, and an easy-to-use design.	719

Best Buy Recommended for home Windows 95-certified Plug and Play All products: 905

TEST PC WORLD CENTER **HOW WE TEST** The overall rating for both small-business/home and corporate printers is based on print quality (25 percent), price (25 percent), features (15 percent), speed (10 percent), service and support (10 percent), and ease of use (15 percent). For all ratings, higher is better. Data based on tests designed and conducted by the PC World Test Center.
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A STAMPEDE OF NEW COLOR printers rumbled through the PC World Test Center this month: Half a dozen new models—slow and fast, for office and home—debuted. None makes our Top 10 chart, however. Though some newcomers are fine choices for specialized markets, most users can find better options.

For example, Epson designed its Stylus Photo 750, and Lexmark its 5770 Color Jetprinter, for photographers. The Lexmark ▶

even includes slots to hold digital camera memory cards. Canon's BJC-5100 offers decent all-around capabilities, but due to its tabloid-size printing, it costs $199—higher than its letter-size competitors. We also tested HP's dual-cartridge, $129 DeskJet 612C, an improvement over some of HP's single-cartridge offerings.

Finally, we reviewed two new corporate models: HP's 2500C, a fast, high-volume ink jet; and Xerox's DocuPrint NC60, successor to the top-notch DocuPrint C55mp.

PHOTO FINISH

EPSON'S STYLUS PHOTO 750 costs $299 and doesn't offer the specialized hardware of the identically priced Lexmark 5770 Color Jetprinter. Instead, Epson stakes the 750's success on print quality and performance. But users who expect it to double as a regular printer will find its 2.1-page-per-minute text speed disappointing. (The Lexmark runs at 3 ppm.)

In print quality, the two are close: The Lexmark's text looks slightly better; its graphics, a little worse. One divergence: The Epson includes a bundle of photo-related software; the Lexmark, none.

INK DIFFERENT

THOUGH PRICES on color lasers have dropped, high-volume ink jets still cost considerably less, especially for jobs that require printing on oversize paper. HP's 2500C ink jet, for example, handles 13-by-19-inch paper and costs $999, while Lexmark's wide Optra Color 1200 LED (not on our chart) runs $5999.

However, the 2500C prints text much more slowly than a laser can; it falls just short of making the corporate chart. Still, its output impressed us—especially the clean, black text and sharp lines (an ink jet's perennial soft spot). Graphics look detailed, if gritty. We also like its voluminous ink tanks and generous paper capacity. Prints land on top of the stack of paper feeding in, though.

THE NETWORKABLE $699 Xerox DocuPrint C20 makes our SOHO chart for the first time, thanks to a $100 price drop.

LASERS AND BARGAINS

THE XEROX DOCUPRINT NC60 carries a $2695 price—high for today's market. Tektronix offers a printer with about the same 9.7-ppm text speed for almost $1000 less. But the NC60 offers such extras as multiple network connections and password-protected print jobs. It prints crisp, black text and detailed, subtle color graphics. It's also exceptionally easy to use, though installation calls for a skilled hand.

Unfortunately, the NC60 can't print labels or envelopes in color, and to print them in black, you must hand-feed them individually through the auxiliary tray. One more complaint: The rear-panel power switch makes it inconvenient to turn this 100-pound monster on and off.

Meanwhile, in the bargain bin, HP jockeys to control the low end of the printer market. The $129 DeskJet 612C is the first bargain model worthy of the HP name. Although the DeskJet 612C misses the small-business/home chart, its dual-cartridge mechanical design significantly improves print quality compared with other HP offerings, such as the single-cartridge DeskJet 420C. The 612C's mildly jagged letters, slightly shadowed type, pale blacks, and grainy graphics could be better, but they still beat the HP 420C's output by a mile. The 612C also runs a lot faster than the 420C: Its text prints at a tolerable 2.3 ppm versus the single-cartridge 420C's unbearably slow 0.5-ppm speed.

Canon's new BJC-5100 delivers similarly lukewarm print quality. Text is readable but shows slight shadowing and loss of detail, and graphics look gritty and pale. The printer offers adequate but unremarkable 2.8-ppm text speed. One clever design feature: The BJC-5100's output tray extends far enough to catch tabloid prints, but fits completely under the printer when not in use.

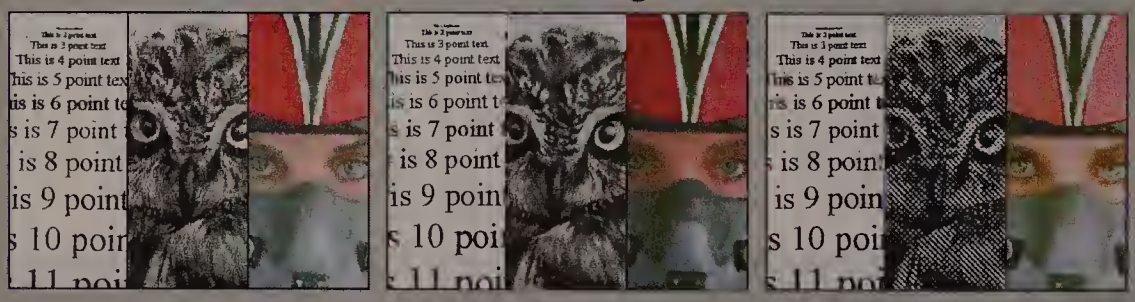
NEW TO YOU

TWO RECENTLY introduced models reach the charts for the first time this month. Xerox cut $100 off the price of its DocuPrint C20, a high-volume, networkable, tabloid-printing color ink jet. Now priced at $699, the C20 squeezes onto the SOHO chart in sixth place. Meanwhile, Canon discontinued the BJC-4400, allowing its sibling, the zippy, well-supported BJC-6000, to take over the seventh slot.

—Dan Littman ■

PRINT QUALITY SAMPLES

Canon Ink Jets' Highs and Lows



CANON BJC-5100

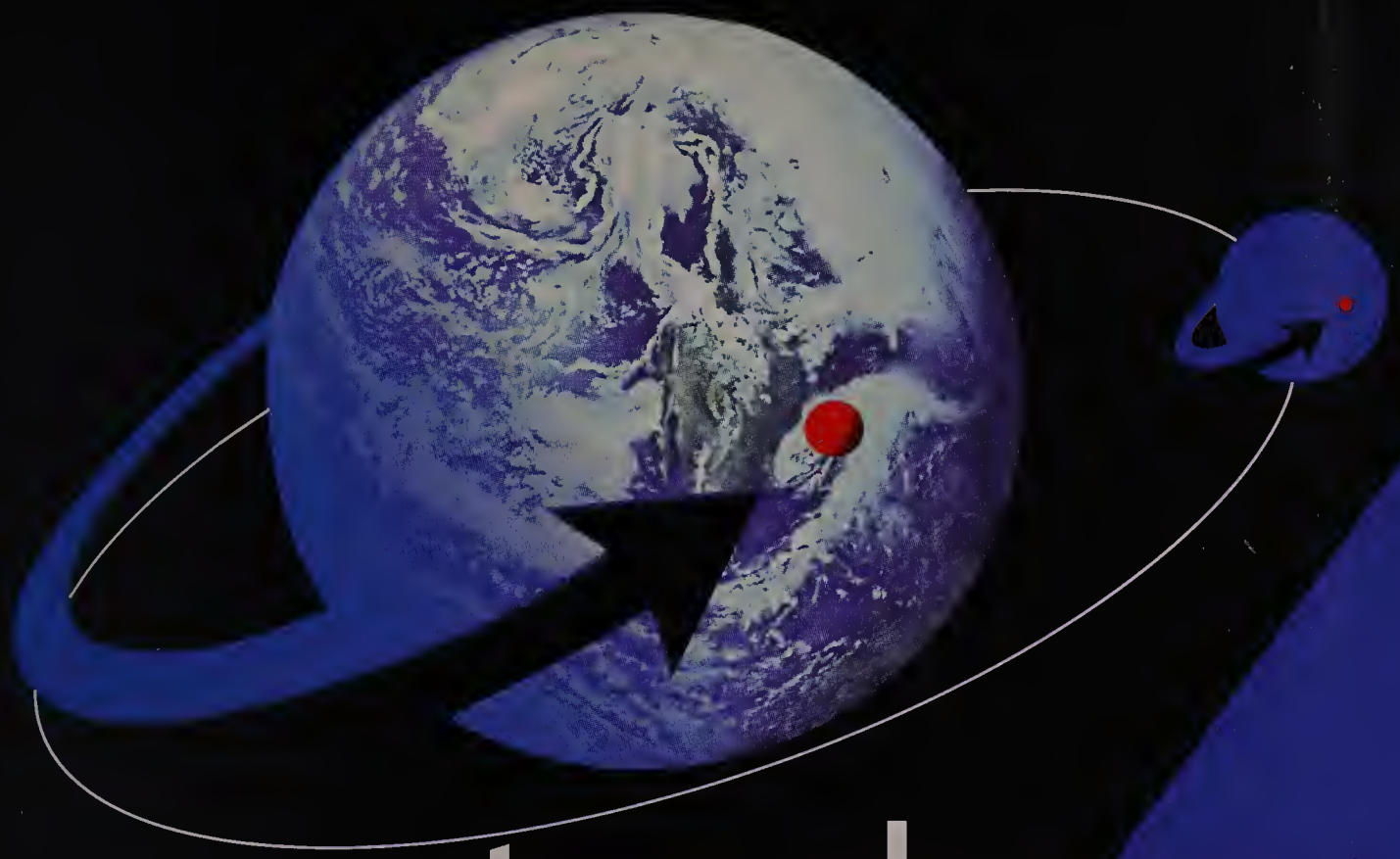
Canon's new tabloid printer misses the chart, and its output quality is lukewarm. Slightly shadowed text loses detail, while pale grays and color images look gritty.

HP 2500C

This high-capacity ink jet prints sharp, dark black text and detailed, if somewhat rough, gray-scale and color graphics. It misses our corporate chart by a hair.

CANON BJC-6000

New to our SOHO chart, Canon's speedy ink jet produces dark, rich text, but both monochrome and color graphics show some rough transitions and lack detail.



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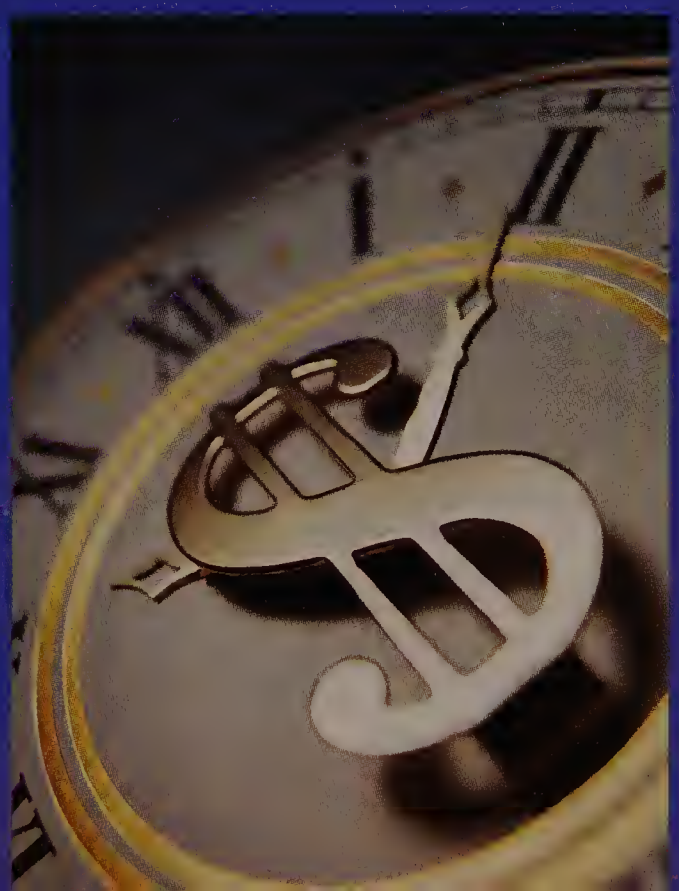

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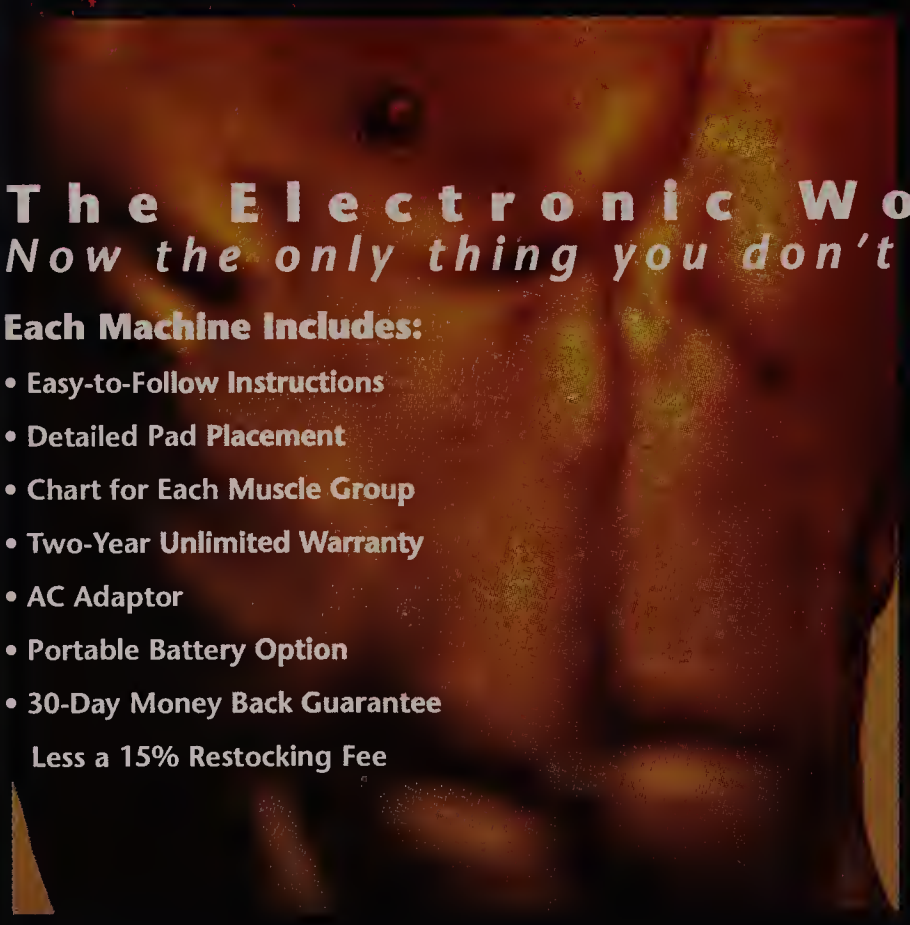

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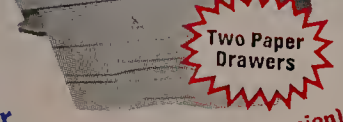

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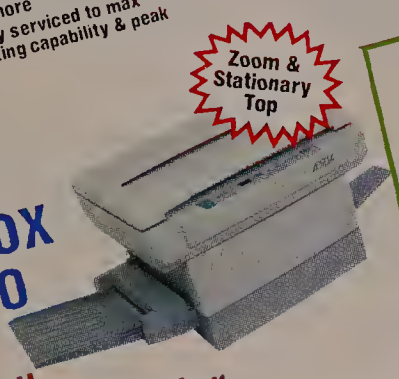

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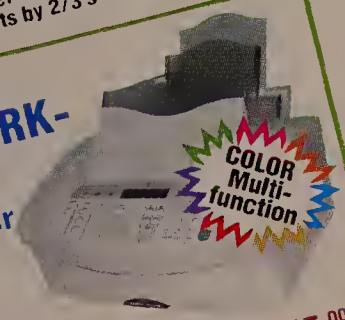

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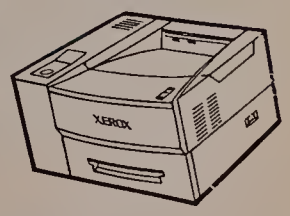

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PC WORLD

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	PCI BOARD	Month tested	Street price (6/5/99)	Overall rating	Mixed-media business rating	3D rating	Features rating	Comments	Product info number
1	Creative Labs 3D Blaster Banshee 800/998-1000 www.soundblaster.com	Mar 99	$80	92	Good	Excellent	Good	FEATURES: 16MB of SDRAM, 250-MHz RAMDAC, 3dfx Voodoo Banshee chip, no bundled applications. SUMMARY: Fine choice for business users and avid gamers is now $20 cheaper. Speedy card includes utility for color-calibrating PC, monitor, and printer.	730
2	Matrox Millennium G200 SD PCI 800/361-1408 www.matrox.com/mga	Feb 99	$119	86	Good	Good	Good	FEATURES: 8MB of SGRAM, 250-MHz RAMDAC, MGA-G200 chip, bundled 3D modeling tool, image editing application, and 3D game. SUMMARY: A good buy thanks to high-level performance and such extras as 3D modeling and photo editing tools.	731
3	Elsa Erazor II 800/272-3572 www.elsa.com	June 99	$109	85	Good	Good	Good	FEATURES: 16MB of SGRAM, 250-MHz RAMDAC, NVidia RIVA TNT chip, no bundled software. SUMMARY: This board performs well in 3D tasks and comes with toll-free support, but it lacks bundled games and applications.	732
4	Creative Labs Graphics Blaster RIVA TNT 800/998-1000 www.soundblaster.com	Apr 99	$100	85	Good	Average	Good	FEATURES: 16MB of SDRAM, 250-MHz RAMDAC, NVidia RIVA TNT chip, no bundled applications. SUMMARY: Provides solid performance and includes a useful color-calibration tool. But this PCI version runs 3D apps slower than its AGP sibling.	733
5	Quantum3D Raven PCI 888/747-1020 www.quantum3d.com	Feb 99	$99	83	Good	Excellent	Average	FEATURES: 16MB of SDRAM, 250-MHz RAMDAC, 3dfx Voodoo Banshee chip, bundled 3D games. SUMMARY: Debuts on chart thanks in part to hefty $50 price cut and speedy 3D performance. But it's short on bundled utilities and support hours.	734
	AGP BOARD								
1	Creative Labs Graphics Blaster RIVA TNT 800/998-1000 www.soundblaster.com	Feb 99	$100	91	Good	Excellent	Good	FEATURES: 16MB of SDRAM, 250-MHz RAMDAC, NVidia RIVA TNT chip, no bundled software. SUMMARY: Good 3D quality and fast performance make this a wise choice for business and home users. Includes top-notch color-calibration utility.	735
2	3dfx Voodoo3 3000 888/234-4334 www.3dfx.com	July 99	$180	90	Excellent	Good	Excellent	FEATURES: 16MB of SDRAM, 350-MHz RAMDAC, 3dfx Voodoo3 chip, bundled 3D games. SUMMARY: Swift performance and handy features (such as connections for viewing games on a TV and capturing video from a VCR) outweigh high price.	736
3	ATI Xpert 128 905/882-2600 www.atitech.com	NEW	$99	89	Good	Good	Excellent	FEATURES: 16MB of SDRAM, 250-MHz RAMDAC, ATI Rage 128GL chip, bundled graphics plug-in and 3D games. SUMMARY: Inexpensive board offers solid performance. A fine upgrade for people who use standard office applications or play games.	737
4	Diamond Stealth III S540 800/468-5846 www.diamondmm.com	NEW	$130	88	Average	Excellent	Good	FEATURES: 32MB of SDRAM, 300-MHz RAMDAC, S3 Savage4 Pro+ chip, bundled 3D visualization tool. SUMMARY: Affordable card delivers fast 3D gaming performance but runs slow in business graphics applications such as PowerPoint.	738
5	ATI Rage Fury 905/882-2600 www.atitech.com	Retested this month	$147	88	Good	Good	Excellent	FEATURES: 32MB of SDRAM, 250-MHz RAMDAC, ATI Rage 128GL chip, bundled 3D games. SUMMARY: $22 price cut and improved performance (thanks to updated drivers) help put Fury on chart, but ATI is still revising drivers to mend Director bug.	739

Best Buy For reviews of products that didn't make the chart, visit www.pcworld.com/t10graphics. All products: 907

PC WORLD TEST CENTER **HOW WE TEST** We test boards under Windows 95. Business tests include PC WorldBench 98, a PowerPoint test, and a Macromedia Director script. Our 3D score is based on four games, each evaluated on frame rate and image quality. For AGP cards we add a texturing test using Caligari's TrueSpace3. We tested PCI boards in a Micron Millennia Mme PC with a Pentium MMX-233 and 32MB of RAM. We tested AGP boards in an NEC Direction 333 with a PII-333 and 64MB of RAM. Overall rating is based on performance (PCI 50 percent, AGP 55 percent), features (25 percent), price (PCI 15 percent, AGP 10 percent), and support policies (10 percent). For all scores, higher is better. Data based on tests designed and conducted by the PC World Test Center. All rights reserved.

THIS MONTH'S CONTENDERS offer some of the fastest 3D speeds we've seen to date. On the AGP side, ATI's new Xpert 128 delivers solid overall performance, making it an affordable pick for business users. Diamond's Stealth III S540 is a better choice for gamers, thanks to superb 3D acceleration and crisp image quality. Another strong performer: Quantum3D's Raven debuts on our PCI chart with the help of a price cut and good 3D speed. ■

ABOVE ALL, ELSA.

Yes! You can create PowerPoint™ presentations and speed through business applications in a fraction of the time. How? With the new ELSA ERAZOR III graphic accelerator car It's powered by the astonishing technolog of ELSA and the NVIDIA RIVA TNT2 processo Together they turn your PC into a high performance productivity cent Stop waiting and start creating spreadsheets, charts, reports...virtually any kind of business presentation in record time. Find us on the web or call 800-272-ELSA for a dealer near you.

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PC WORLD

TOP 10 MONITORS

	17-INCH MONITOR	Month tested	Street price (5/22/99)	Overall rating	Quality of text/graphics	Comments	Product info number
1	IBM P72 800/426-7255 ext. 4753 www.pc.ibm.com	Oct 98	$459	91	Excellent/ Excellent	**FEATURES:** 15.7-inch viewable area, .25mm stripe pitch Trinitron tube, up to 85-Hz refresh rate,[1] Plug and Play ready,[2] TCO'95 compliant, three-year warranty, 24-hour toll-free support. **SUMMARY:** $50 price cut eases P72 back into first place. Sleek style, gorgeous colors, and generous support justify higher-than-average price.	–
2	ViewSonic PT775 800/888-8583 www.viewsonic.com	Oct 98	$439	90	Very good/ Excellent	**FEATURES:** 15.9-inch viewable area, .25mm stripe pitch Diamondtron tube, up to 117-Hz refresh rate,[1] Plug and Play ready,[2] TCO'95 compliant, three-year warranty, 24-hour toll-free support. **SUMMARY:** Expanded support hours keep low-cost professional model a Best Buy. Lush and lively colors well suited for graphics work.	741
3	Samsung SyncMaster 700p Plus 800/933-4110 www.samsung-monitor.com	Oct 98	$389	89	Very good/ Very good	**FEATURES:** 15.6-inch viewable area, .26mm dot pitch tube, up to 120-Hz refresh rate,[1] Plug and Play ready,[2] TCO'95 compliant, three-year warranty, 24-hour toll-free support. **SUMMARY:** Competitive pricing helps handsome model maintain good showing; bright colors and high refresh rate are other pluses. Controls have cryptic icons.	742
4	Optiquest V73 800/843-6784 www.optiquest.com	Apr 99	$295	88	Very good/ Excellent	**FEATURES:** 16-inch viewable area, .26mm dot pitch tube, up to 85-Hz refresh rate,[1] Plug and Play ready,[2] TCO'95 compliant, three-year warranty, 16-hour daily toll-free support (excluding Sundays). **SUMMARY:** Cheapest unit here sheds another $44. Shows rich colors, but controls require tedious button pressing.	743
5	Iiyama VisionMaster Pro 410 800/394-4335 www.iiyama.com	NEW	$469	87	Very good/ Excellent	**FEATURES:** 15.7-inch viewable area, .25mm stripe pitch Diamondtron NF tube, up to 115-Hz refresh rate,[1] Plug and Play ready,[2] TCO'95 compliant, three-year warranty, 12-hour weekday toll-free support. **SUMMARY:** Generic design, but well-priced model has newest-generation flat CRT and nice colors. Support hours could be longer.	744
6	Sony CPD-220GS 800/352-7669 www.sony.com/displays	June 99	$449	86	Very good/ Excellent	**FEATURES:** 15.6-inch viewable area, .25mm stripe pitch Trinitron tube, up to 85-Hz refresh rate,[1] Plug and Play ready,[2] TCO'95 compliant, three-year warranty, 24-hour toll-free support. **SUMMARY:** Bold colors and sharp text compensate for above-average price. Clearly presented controls are easy to learn and navigate.	745
7	Mitsubishi Diamond Plus 71 800/843-2575 www.mitsubishi-display.com	NEW	$369	86	Very good/ Very good	**FEATURES:** 15.9-inch viewable area, .25mm stripe pitch Diamondtron tube, up to 85-Hz refresh rate,[1] Plug and Play ready,[2] TCO'95 compliant, three-year warranty, 12-hour daily toll-free support. **SUMMARY:** Low price, finely balanced picture quality. Features a retractable control panel and sensitive, easily navigable controls.	746
8	AcerView 79g 800/379-2237 ext. 125 www.acerperipherals.com	Oct 98	$429	86	Very good/ Excellent	**FEATURES:** 15.9-inch viewable area, .25mm stripe pitch Diamondtron tube, up to 110-Hz refresh rate,[1] Plug and Play ready,[2] TCO'95 compliant, three-year warranty, 24-hour toll-free support. **SUMMARY:** Outclassed by newer models, but looks stately and displays lush colors. Icons for on-screen controls are crudely designed.	747
9	NEC MultiSync E750 800/632-4636 www.nectech.com	Apr 99	$449	85	Very good/ Very good	**FEATURES:** 15.9-inch viewable area, .25mm slot pitch CromaClear tube, up to up to 114-Hz refresh rate,[1] Plug and Play ready,[2] TCO'95 compliant, three-year warranty, 11.5-hour weekday toll-free support. **SUMMARY:** Another $50 price cut keeps the NEC in the running. Easy-to-use on-screen controls and space-saving design.	748
10	DecaView PA 380 800/707-6688 www.decaview.com	NEW	$599	85	Very good/ Excellent	**FEATURES:** 15.7-inch viewable area, .25mm stripe pitch Diamondtron tube, up to 85-Hz refresh rate,[1] Plug and Play ready,[2] TCO'95 compliant, three-year warranty. 9-hour weekday toll-free support. **SUMMARY:** High price and shortest tech support hours here overshadow sharp text and nicely saturated colors.	749

Best Buy For reviews of products that didn't make the chart, visit www.pcworld.com/t10monitors. All products: 908

TEST PC WORLD CENTER **HOW WE TEST** Ten judges rate a monitor's text and graphics quality. We evaluate each unit on how well it displays typical business letters, a newsletter, spreadsheets, Web pages, and scanned images. The overall rating is based on text and graphics quality (25 percent each), features and ease of use (25 percent), price (20 percent), and service and support (5 percent). The best possible overall rating is 100. Data based on tests designed and conducted by the PC World Test Center. All rights reserved.

[1] Highest refresh rate at 1024 by 768 resolution. [2] Plug and Play monitors and graphics cards can communicate bidirectionally. However, Windows 95 does not fully utilize monitor Plug and Play.

IMPROVED IMAGE QUALITY and falling prices make it easier than ever to find a top-notch 17-inch monitor—the average street price currently hovers around $430. ViewSonic has expanded its toll-free support to 24 hours, seven days a week, while the debuting Iiyama VisionMaster Pro 410 sports the latest flat CRT, a good choice if you work with graphics. New models from Compaq, Cornerstone, CTX, and Princeton failed to make the cut. ■

Your Family *before* HP Idea Kits.

Zoom! Your family will have a blast with the latest HP Idea Kit *Family Fun in the 21st Century*. The kit comes with project ideas, Mindscape® PrintMaster™ Gold and Adobe® PhotoDeluxe™ software, and special paper samples that transform your PC and color inkjet printer into a family fun center. To get started, explore the projects in this helpful little booklet. Then, send in the order form below to get the complete kit. Soon your whole family will be greeting the new millennium with a hearty "*Yahoo!*"

Plus, print great projects right off the Web:
www.hp.com/go/printsville

Your Family *after* HP Idea Kits.

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Fill in: Name and address information at right
Enclose:
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2) The UPC symbol (bar code including the numbers 88698) from the HP inkjet print cartridge package
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P.O. Box 8579
St. Cloud, MN 56398-8579
Postmark no later than December 31, 1999

MAIL-IN CERTIFICATE: Offer Expires December 31, 1999 **G02**

Name _____

Address _____

City _____ State _____ Zip _____

E-mail address _____

May HP contact you with more information? ❑ yes ❑ no

(check all that apply)
What model HP inkjet printer do you have at home?
❑ OfficeJet (All-In-One) ❑ DeskJet model* (s) _____

Will you use this kit for business? ❑ for personal projects? ❑

Sorry, not available for Mac® OS. Not optimized for Windows® 98.

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If you have any questions regarding this offer, please call the HP Award Center at 1-612-295-8172, from 7 a.m. to 5 p.m. CST, Monday through Friday.

Allow 8 weeks for processing. While supplies last. Offer good in U.S. only and void where prohibited, taxed or restricted by law. Only purchases by end-user customers from authorized HP resellers qualify for offer. HP reserves the right to request additional information and to confirm identity of submitter. Providing false information disqualifies this claim, and may subject the submitter to criminal prosecution. Order must be postmarked between 7/7/99 and 12/31/99. Only original proofs of purchase (UPC symbols) may be submitted. Limit one kit per household.

HP If you can imagine it, you can print it. Idea Kits

Circle 100 on card or go to www.pcworld.com/productinfo

Family Fun

in the 21st Century

Projects and ideas to help you zoom into the future with your HP color inkjet printer.

HEWLETT® PACKARD

xpanding Possibilities

HP Idea Kits

If you can imagine it, you can print it.

The 21st Century is coming

The world is changing so fast. New technologies appear every day. But one thing is sure to stay the same—how families have fun. We've put together this booklet to show you how to use the technology of today, your computer and color inkjet printer, to have fun in the 21st Century. It's full of projects and ideas that will have you greeting the new millennium with a hearty "Yahoo!"

Check out this booklet and the complete HP Idea Kit, *Family Fun in the 21st Century*, for ways to put fun into everything your family does. **Use the order form on the back of this booklet to get the full kit**, including more how-tos, easy to use software, even special paper samples to zoom your family into the future!

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Team of the Future

You never know where the next sports superstar is going to come from. So let's provide some motivation by creating team shirts.

Team shirt

Take your school or team logo and make a T-shirt. When you have it on, everyone will know you support the home team 100%.

What you need:

Mindscape® PrintMaster™ Gold 4.0
HP Iron-On T-Shirt Transfers
White cotton T-shirts and an iron

1. Get a copy of your school or team logo. If you are using your own scanner, follow the directions that came with it for scanning a photo. Or, take the logo to a copy shop and have them scan it for you.
2. Open *PrintMaster Gold*, click *Brand New*, *Poster*, *Tall* and *Finish*.
3. Click . In the *Art Gallery* window, pull down the *File* menu and click *Open from Disk*. Find your file and double-click it.
4. Drag the logo to the center of the page. If you need to, use the corner handles to re-size it.
5. Add a headline. Click T, then click and drag a text box above the logo. Type something that says how you feel about the team in the text box. To change the way the text looks, highlight it and use the text toolbar at the top of the screen to change the size, type style and alignment. Center the text over your logo by clicking and dragging on the dashed line.
6. Done with your design? Now you need to make a mirror image of it so it looks right when you iron it onto a T-shirt. Pull down the *Edit* menu and click *Select All*. Pull down the *Arrange* menu and click on *Mirror left to right*. Save your work.
7. It's time to print. Place a sheet of HP Iron-On T-Shirt Transfer paper in the printer tray following the instructions from the package. Click *File*, then *Print Setup*. Click *Setup* or *Properties* and make sure *Best* print quality is selected. Now print.
8. Iron your design onto a T-shirt following the HP Iron-On T-Shirt Transfer instructions **exactly**. Ironing transfers can be tricky, so practice on scraps of fabric first.

TIP: You can make trading cards of your favorite player. If you have the HP Idea Kit, *Family Fun in the 21st Century*, just follow step 1 on page 3 to open our trading card template *Tradecrd.sig*. Then click to add a photo. Position it over the photo area. To resize the photo, press the *Control* button and click and drag a corner handle. Use T to personalize the *Team Name* and *Player Name*. Print on HP Premium Photo Paper.

Fantastic voyage

No matter what part of the galaxy you're from, families take vacations. You can make future vacations more fun with these projects.

Travel bingo card

Even on a trip to Mars kids can get bored. A good way to pass time is with travel bingo cards. Each card has pictures of things you're likely to see along the way. For example, a Mars trip would have pictures of stars and planets. If you're taking a drive in the country, make yours with pictures of farms, animals, bridges, etc. Give a card and a pen to each member of the family. The first one to see everything on their card wins.

What you need:

Mindscape® PrintMaster™ Gold 4.0
HP Professional Brochure and Flyer Paper

1. Open *PrintMaster Gold* and pull down the *File* menu. Click *Open*. In the *Project Gallery* window, pull down the *File* menu and click *Open from Disk*. Find *Disc 1* from the HP Idea Kit, *Family Fun in the 21st Century*. Open the *HP_Art folder*, then *Template*. Double-click the file called *Bingo.sig*. (Double-click *Bingodone.sig* to see a sample card.)
2. Click . Using the *Keyword* box, search the *Art Gallery* for pictures and artwork to fill your grid. Use the black handles to position and re-size the pictures so they fit inside the boxes. Fill every box with a different picture.
3. Now, it's time to print. Place a sheet of HP Professional Brochure and Flyer Paper in the printer tray. Click *File*, then *Print Setup*. Click *Setup* or *Properties* and make sure *Best* print quality is selected. Now print.
4. Print one copy for each member of your trip.

Vacation photo collage

Vacation is over. Bummer. Why not make a photo collage to remember it by? Follow the directions below to make a collage with *PrintMaster Gold*. Find an empty picture frame and print the collage to fit your frame. Finally, hang it up for all to see.

What you need:

Mindscape PrintMaster Gold 4.0
Adobe® PhotoDeluxe™ 2.0
HP Bright White Inkjet Paper
Any size picture frame

1. Gather photos from your vacation. If you have a scanner, scan the photos directly into your PC. If not, have a copy shop scan them to a disk.
2. Start *PrintMaster Gold*. Click *Brand New*, *Poster*, *Tall* or *Wide* then *Finish*.
3. Make a background color for the collage. Click . Click and drag to make a box that covers the entire page. Click to choose a color.

4 Now, add your pictures. Click . In the *Art Gallery* window, pull down the *File* menu and click *Open from Disk*. Find a photo file and double-click it. Click and drag the photo to position it on the page. Change its size by clicking and dragging on a corner handle. Repeat this step for the rest of your photos.

5 Need to rotate a photo before using it in *PrintMaster*? Open *Adobe PhotoDeluxe*. Pull down the *File* menu and click *Open File*. Find your picture file and double-click it. If you don't see the *Orientation* menu, click *File*, *Preferences* and *Long Menus*. Pull down the *Orientation* menu and click *Rotate Left* or *Rotate Right*. Pull down *File*, choose *Send to* and then *File format*. Choose *JPEG* from the *Save As* box. Name your photo and click *Save*. Return to Step 4 when you're done.

6 Now, let's make a headline. Click on . Click and drag to make a text box. Type in a headline. Highlight the text and use the text toolbar to change the font style, size and alignment. Click to change the color. Save your work.

7 Measure your picture frame with a tape measure and write down the dimensions.

8 Click *File*, then *Print Setup*. Click *Setup* or *Properties* and make sure *Best* print quality is selected. Click and, in the print window, click *Output Size*. Set *Inches Wide* or *Inches Tall* to match the frame you're going to use. Fill your printer tray with HP Bright White Inkjet Paper. Click *Print*.

9 If your frame is bigger than a single sheet of paper it will print on multiple sheets called tiles. *PrintMaster Gold* prints trim marks on each tile to help you cut it accurately and join it all together. Tape the tiles together and place it in your frame.

Explore inner space

A rainy day is no excuse not to have fun. If you're stuck inside, make a time capsule. Start with an empty coffee can, wrap it in paper of your own design, then gather things from around the house (like a newspaper clipping, a toy, a picture, a list of your favorite songs, etc.) to put inside. Seal it and hide it. Pick a date in the future to open it, like a birthday or holiday, and mark it on your calendar.

Time Capsule

Follow these instructions to design your own time capsule, or print one just like ours by visiting *Printsville* at **www.hp.com/go/printsville**.

What you need:

Mindscape® PrintMaster™ Gold 4.0
Small coffee can (1 lb. or less)
Aluminum foil
HP Premium Inkjet Glossy Paper

1. Open *PrintMaster Gold*, click *Brand New*, *Poster*, *Wide* and *Finish*.
2. Start by making a plaque for the time capsule. Click and make a box by clicking and dragging your mouse. Don't worry what shape it is, you're going to change it.
3. Right-click your mouse in the box. Choose *Position*, then click on *More* from the menu. Click the *Size* tab. With a ruler, measure the can from top to bottom. Enter the height of the can in inches in the *Height* box. Enter 10" in the *Width* area. Click *OK*. Now click on the right hand side of the screen to center the rectangle.
4. Click and choose a background color. Click and make a text box in the center of the rectangle. Type in the plaque for your time capsule. Include the date you're going to open it.
5. Place a sheet of HP Premium Inkjet Glossy Paper in your printer tray, shiny side down for most printers. Click *File*, then *Print Setup*. Click *Properties* and select *Best* quality. Click *OK*. Now print. Trim off the white space and attach it to the can with a glue stick or tape.
6. Now it's time to cover the rest of the capsule. Repeat steps 1, 2 and 3. Click and choose a background color that contrasts with your plaque. Click and choose some clipart from the gallery to give your capsule a futuristic look.

7 Now print. Trim off the white space. Wrap this piece around the can. Trim off any excess so it doesn't cover your plaque. Attach it to the can with a glue stick or tape.

8 Finally, cover the lid with the foil, fill the time capsule, close the lid and wait for your open date.

Stickers

Stickers are a fun and colorful way to personalize school projects, notebooks, lunch bags and more. You can even make team stickers like the one below. And with HP Restickables Inkjet Stickers, your stickers come off as easy as they go on because they're made with the same type of adhesive found on 3M Post-it® notes.

What you need:

Mindscape PrintMaster Gold 4.0
HP Restickables Large Round Inkjet Stickers

1 Open *PrintMaster Gold*, click *Brand New, Label* and *Next*. Scroll down and double-click *#3113*. Now you have the workspace for your sticker.

2 For text, click T and click in the workspace to make a text box. To move it, click between the selection handles. Hold down the mouse button and drag. Use the text toolbar to set your font style and size.

3 Want to add a picture? Click , select a *Category* and double-click a picture you like. To resize it, click a selection handle. Hold down the mouse button and drag in or out. To move it, click on it and drag it.

4 Place a sheet of HP Restickables Large Round Inkjet Stickers in the printer tray, with the stickers facing down for most inkjet printers. Click *File, Print Setup* and then *Properties*. Choose *Best* quality. Click *OK*. Now print. Each sheet will have nine stickers.

Future CEO

Looking for a way to make some extra money after school? The family PC is the perfect tool. With *PrintMaster Gold* you can make signs, greeting cards and more for people in your neighborhood. First, make a flyer to show people what you and your computer can do. Then make business cards to hand out.

Flyers

You've got skill! You've got talent! But nobody knows about it. You need to advertise. Make a flyer and get the word out.

What you need:

Mindscape® PrintMaster™ Gold 4.0
HP Bright White Inkjet Paper

1. Open *PrintMaster Gold*, click *Brand New*, *Poster*, *Tall* and *Finish*.
2. Click and click and drag a rectangle over the whole page. Click and choose a background color.
3. Click and search the clipart gallery for a picture that shows what you do.
4. Or add a photo of yourself or the service you provide. Click . In the *Art Gallery* window, pull down the *File* menu and click *Open from Disk*. Find your photo file and double-click it. Drag the photo to where you want it.

5 Click T and make a text box at the top of the page. Type in what you do and choose a typeface and size that will get attention.

6 Click T and make a text box at the bottom of the page. Type your name and a way you can be reached (phone or e-mail).

7 Now, print as many copies as you need and place them where your customers will see them.

Business cards

Having business cards tells people you take yourself, and their business, seriously. And they're handy reminders to call you when they have a job.

What you need:

Mindscope PrintMoster Gold 4.0
HP Premium Photo Poper

1 Open *PrintMoster Gold*, click *Brond New* and *Business Cord*. Select *Wide* or *Toll*, then *Finish*.

2 Click ▭ and click the top left corner of the card (not the gray line, but the very edge of the card); drag down to the bottom right corner. This is your cutting guide. Click 🪣 and choose a color if you want, or click *None* for a card with a white background.

3 Add some clipart. Click 🖼, select a *Category* and double-click a picture you like.

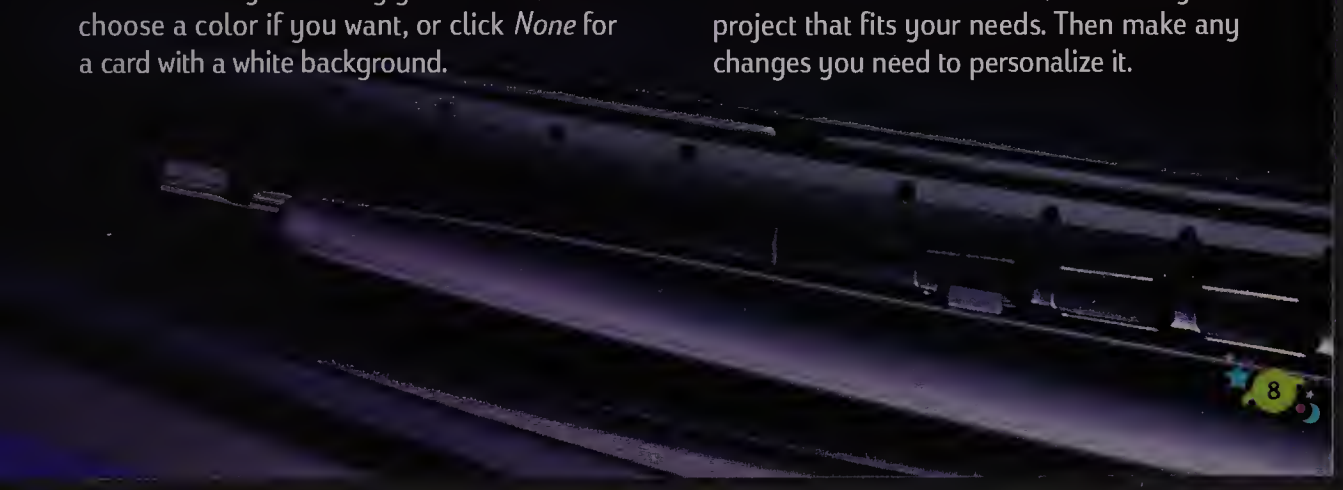
4 To resize it, click a selection handle. Hold down the mouse button and drag in or out. To move it, click on it and drag.

5 Click T and click on the page to make a text box. To move it, click between the selection handles until the cursor changes to crosshairs. Hold down the mouse button and drag. Use the text toolbar to set your font style and size. Type in the name of your company. Repeat this step and add your name and how people can reach you.

6 Place a sheet of HP Premium Photo Paper in the printer tray, glossy side down for most inkjet printers. Click *File*, then *Print Setup*. Select *HP Premium Photo Poper* in printer *Properties*. Click *OK*. Now print. Carefully cut them out.

Odd jobs

What kind of jobs can you do with *PrintMaster Gold*? Explore the project gallery and find out! From the welcome screen, click on *Reody-Mode*. You can browse or search over 100 projects. You can make banners, "for sale" signs, greeting cards, business forms and more. First, find a ready-made project that fits your needs. Then make any changes you need to personalize it.



The future of education

School can be overwhelming at times. There's so much to remember. Keeping organized will help reduce stress and put you in control.

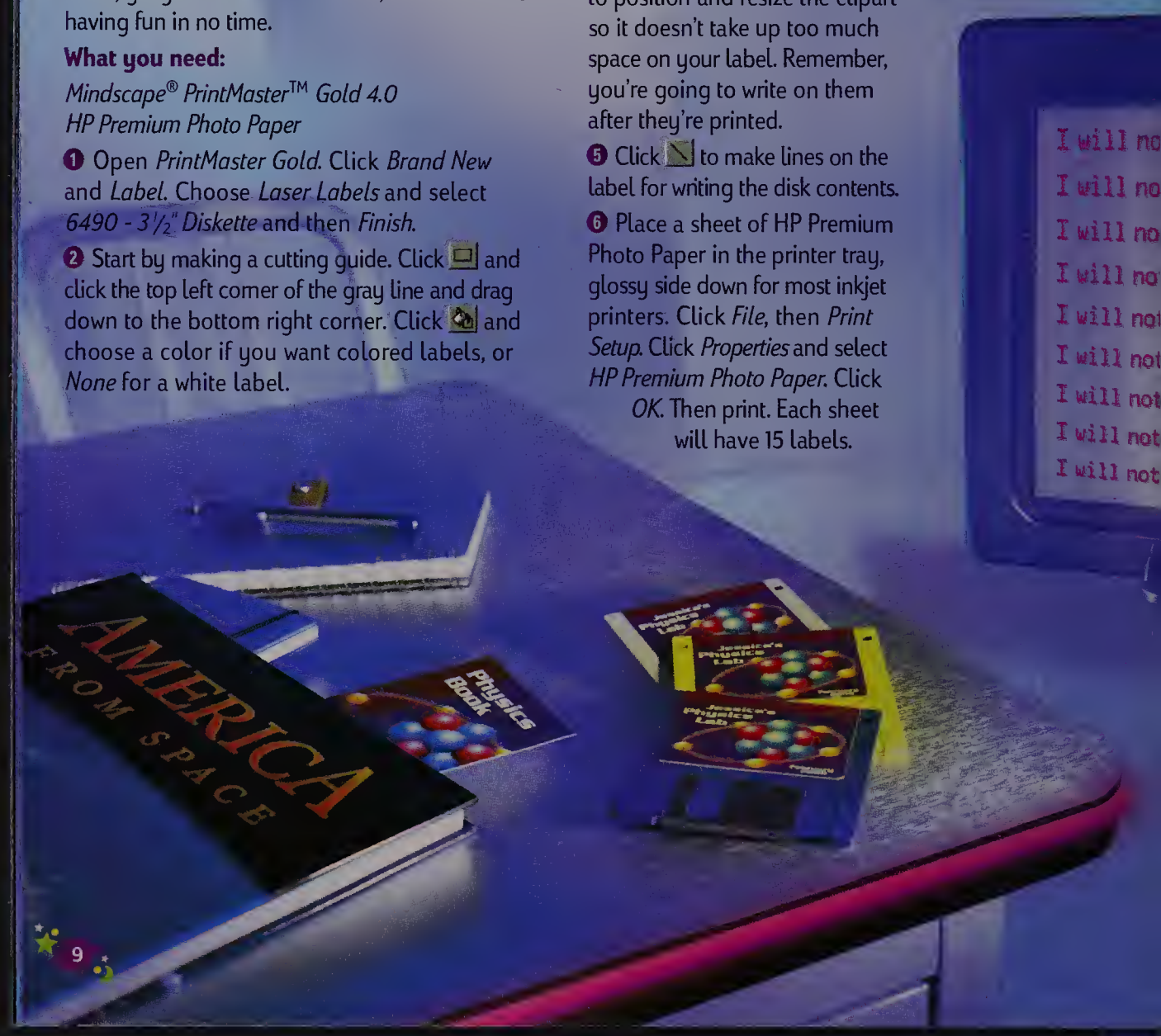
Disk labels

Keeping your computer disks labeled is a real time saver. You'll find what you're looking for faster, get your work done sooner, and be back to having fun in no time.

What you need:

Mindscape® PrintMaster™ Gold 4.0
HP Premium Photo Paper

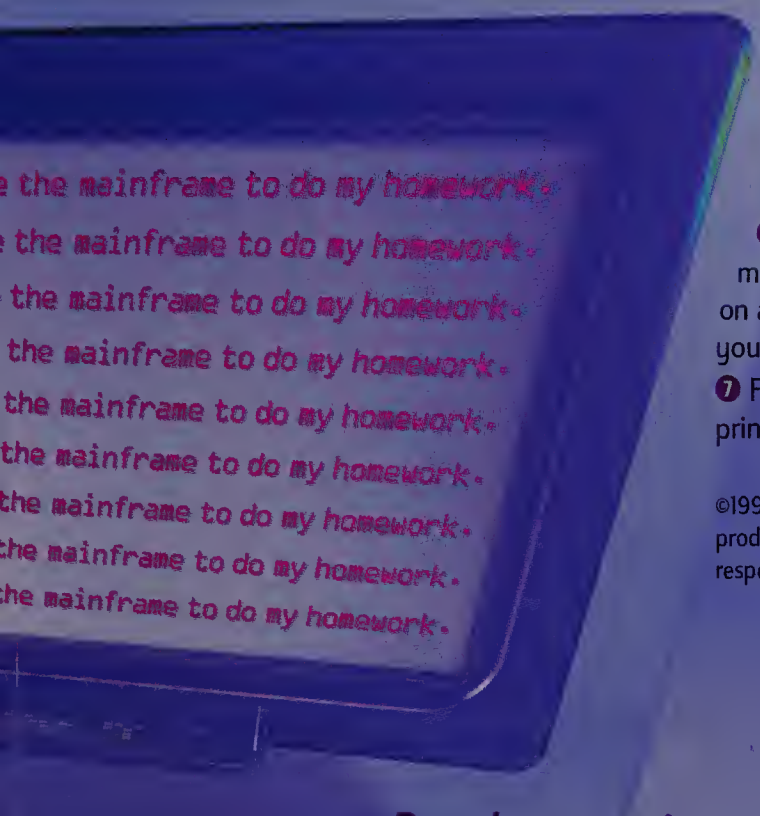
1. Open *PrintMaster Gold.* Click *Brand New* and *Label.* Choose *Laser Labels* and select *6490 - 3½" Diskette* and then *Finish.*
2. Start by making a cutting guide. Click and click the top left corner of the gray line and drag down to the bottom right corner. Click and choose a color if you want colored labels, or *None* for a white label.
3. Click to make a text box. To move it, click between the selection handles. Hold down the mouse button and drag. Use the text toolbar to set your font style and size. Type a heading, like "Scott's Files," for your labels.
4. Now add some clipart. Click . Search or browse through the images until you find one you like. Then double-click it. Use the black handles to position and resize the clipart so it doesn't take up too much space on your label. Remember, you're going to write on them after they're printed.
5. Click to make lines on the label for writing the disk contents.
6. Place a sheet of HP Premium Photo Paper in the printer tray, glossy side down for most inkjet printers. Click *File*, then *Print Setup.* Click *Properties* and select *HP Premium Photo Paper.* Click *OK.* Then print. Each sheet will have 15 labels.



Carefully cut them out and use a glue stick to put them on your diskettes. Be careful not to get any glue on the moving parts of the diskettes!

Bookmarks

Computers may be everywhere, but books are going to be with us for a long time to come. Follow the instructions to the right to make personalized bookmarks, or go to *Printsville* and download and print one of the pre-made designs. See the Web address below.



What you need:

Mindscape PrintMaster Gold 4.0
HP Premium Photo Paper

❶ Open *PrintMaster Gold*, click *Brand* / *Wide* and *Finish*.

❷ Click and make a box by click dragging your mouse.

❸ Right-click your mouse in the box *Position* and then click on *More* from Click the *Size* tab. Enter 2.00 in the *W* and 7.55 in the *Height* area. Click *OK*.

❹ Click and choose a co your background.

❺ Next, use and to ac and clipart. Follow steps ❸ an the *Team shirt* project on page and place a photo file.

❻ Repeat steps ❷ through ❺ abov more bookmarks. You can fit four bo on a page with space in between. Now, your work.

❼ Follow step ❻ on the previous page printing instructions.

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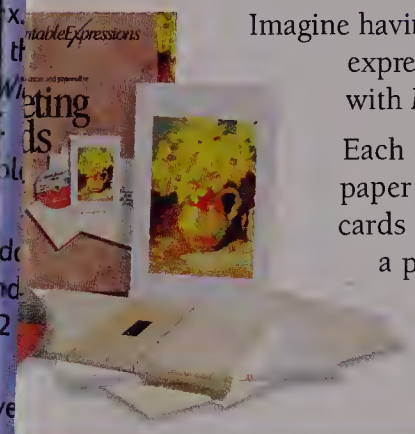
PrintableExpressions lets you create beautiful cards that express your true feelings.



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(check all that apply)

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model #(s)

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PC WORLD

TOP 10 MODEMS

	INTERNAL V.90 MODEM	Month tested	Street price (5/24/99)	Overall rating	56-kbps downloads/ 33.6-kbps transfers (min:sec per MB)	Comments	Product info number
1	MaxTech XPV56P NetPacer V.90 56K Internal Voice Modem 800/936-7629 www.maxtech.com	June 99	$38	81	4:04/6:01	**FEATURES:** Supports K56flex, PCI card, Lucent chip set, V.80 videoconferencing, voice mail, speakerphone, Caller ID, SuperVoice software. **SUMMARY:** Feature-packed modem offers adequate performance and a five-year warranty at a stunningly low price. The bundled SuperVoice software could stand some improvement.	720
2	Digicom Systems Modem Blaster Flash 56K PCI 800/833-8900 www.digicomsys.com	Retested this month	$50	80	3:43/5:40	**FEATURES:** Supports K56flex, PCI card, Rockwell chip set, V.80 videoconferencing, MNP-10, distinctive ring, voice mail, speakerphone, ASVD, Caller ID, QuickLink Message Center III software. **SUMMARY:** Full-featured unit backed by daily 14-hour support. Documentation gets a face-lift, and new drivers improve performance.	721
3	Zoom FaxModem 56K PCI Dualmode 800/631-3116 www.zoom.com	Jan 99	$64	79	4:16/5:40	**FEATURES:** Supports K56flex, PCI card, Rockwell chip set, MNP-10EC, V.80 videoconferencing, distinctive ring, voice mail, Communicate software. **SUMMARY:** Top choice for SOHO users on a strict budget comes with voice features and is backed by long support hours. But it runs a little slow on 56-kbps downloads.	722
4	Diamond Multimedia SupraExpress 56i Sp 800/468-5846 www.diamondmm.com	Jan 99	$80	79	3:41/5:41	**FEATURES:** Supports K56flex, 16-bit ISA card, Rockwell chip set, V.80 videoconferencing, distinctive ring, voice mail, speakerphone, Caller ID, FaxTalk Communicator software. **SUMMARY:** Excellent candidate for home offices performs well and offers lots of features. Support available 14 hours daily except Sunday.	723
5	Boca WinStorm 56K Internal Speakerphone Modem 561/997-6227 www.bocaresearch.com	Retested this month	$70	78	4:11/5:43	**FEATURES:** Supports K56flex, PCI card, Rockwell chip set, MNP-10EC, distinctive ring, voice mail, speakerphone, Caller ID, QuickLink Message Center III software. **SUMMARY:** Affordable modem with voice features performs at about the average for controllerless PCI modems; retesting shows improved 56-kbps connect rate.	724
6	Viking V.90 56K ISA Modem 800/338-2361 www.vikingcomponents.com	Feb 99	$60	78	3:23/5:41	**FEATURES:** Supports K56flex, 16-bit ISA card, Rockwell chip set, voice mail, speakerphone, QuickLink Message Center III software. **SUMMARY:** ISA modem boasts the fastest 56-kbps performance on the chart. Viking's skimpy manual isn't very helpful, but you get around-the-clock support.	725
7	Amquest Host PCI 56K Dual Mode Voice/Speakerphone 877/663-3648 www.amquestmodem.com	Feb 99	$49	78	3:35/5:39	**FEATURES:** Supports K56flex, PCI card, Rockwell chip set, MNP-10EC, V.80 videoconferencing, voice mail, speakerphone, VoiceView, ASVD, DSVD, Caller ID, Amquest @fax.com software. **SUMMARY:** Second-cheapest modem here is fast and provides many voice features. We had some trouble installing it, though.	726
	EXTERNAL V.90 MODEM						
1	Diamond Multimedia SupraExpress 56e 800/468-5846 www.diamondmm.com	Feb 99	$100	81	3:23/5:40	**FEATURES:** Supports K56flex, Rockwell chip set, V.80 videoconferencing, distinctive ring, voice mail, Caller ID, permanently attached serial cable, FaxTalk Communicator software. **SUMMARY:** The fastest modem on the chart is affordable, easy to install, small, portable, and backed by long support hours.	727
2	Viking 56K USB Modem 800/338-2361 www.vikingcomponents.com	NEW	$120	79	3:40/5:43	**FEATURES:** Supports K56flex, Rockwell chip set, MNP-10EC, V.80 videoconferencing, USB cable, distinctive ring, Caller ID, QuickLink Message Center III software. **SUMMARY:** Average 56-kbps downloads, around-the-clock support, and simple USB setup make this a solid choice for home users. Stylish but bulky shark-fin shape.	728
3	Digicom Systems Modem Blaster Flash 56 II External 800/833-8900 www.digicomsys.com	Apr 99	$90	77	3:44/5:40	**FEATURES:** Supports K56flex, Rockwell chip set, V.80 videoconferencing, MNP-10, serial cable, distinctive ring, voice mail, speakerphone, ASVD, Caller ID, QuickLink Message Center III software. **SUMMARY:** Affordable, feature-rich modem with slightly poky 56-kbps performance; includes markedly improved manual.	729

Best Buy online For reviews of products that didn't make the chart, visit www.pcworld.com/t10modems. All products: 906

TEST PC WORLD CENTER **HOW WE TEST** We test V.90 (56-kbps) and V.34 (33.6-kbps) performance over a Telecomm Analysis Systems simulated phone network. We connect each modem to two common Internet service provider modems—Ascend's Max 6000 and 3Com's Total Control. Using each ISP modem, we perform two tests. In the Network Model Coverage test, we send a .zip file over several different line conditions. In the File Type test, we send a mix of four files—graphics, text, program, and compressed—over one line condition. We average the results for the two ISP modems to calculate NMC and FT scores, which make up, respectively, 60 and 40 percent of the total performance score. Data based on tests designed and conducted by the PC World Test Center. All rights reserved.

A NEW BREED of external modem debuts on the chart this month: Viking's pricey 56K USB sports a stylish shark-fin design and performs similarly to the Best Buy Diamond Multimedia SupraExpress 56e. Among internal modems, Digicom's Modem Blaster Flash 56K PCI and Boca's WinStorm 56K Internal Speakerphone turn in faster performance this month thanks to new drivers, and Digicom's manuals get a much-needed update. ■

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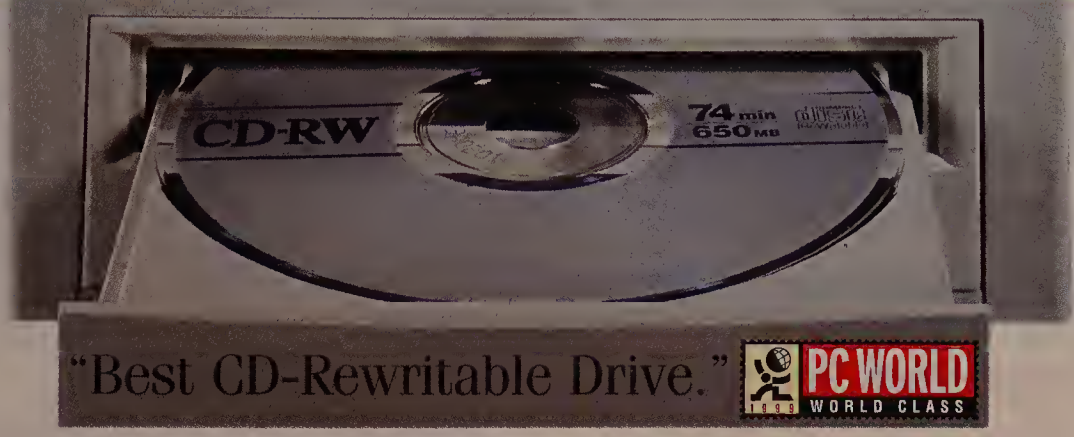

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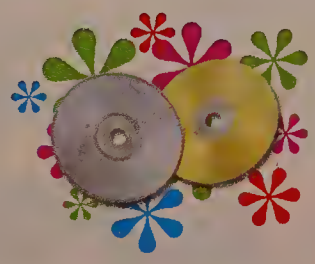

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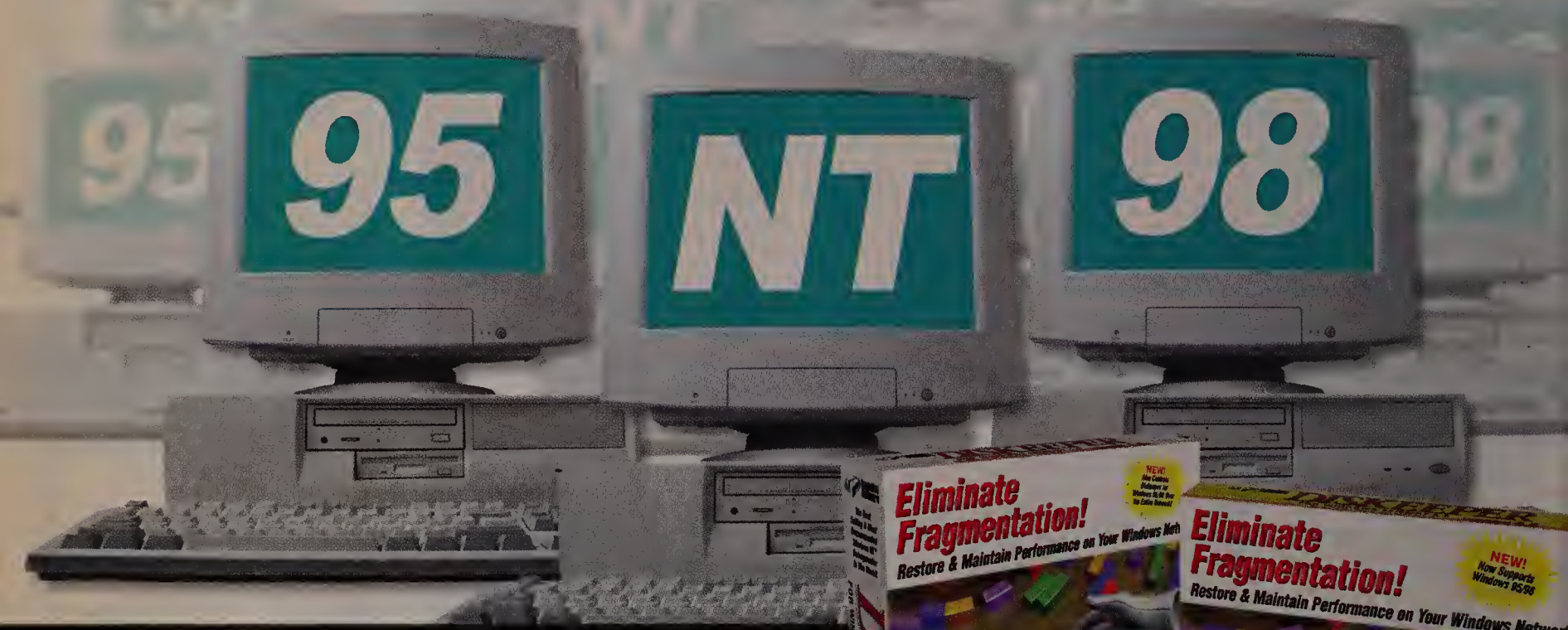

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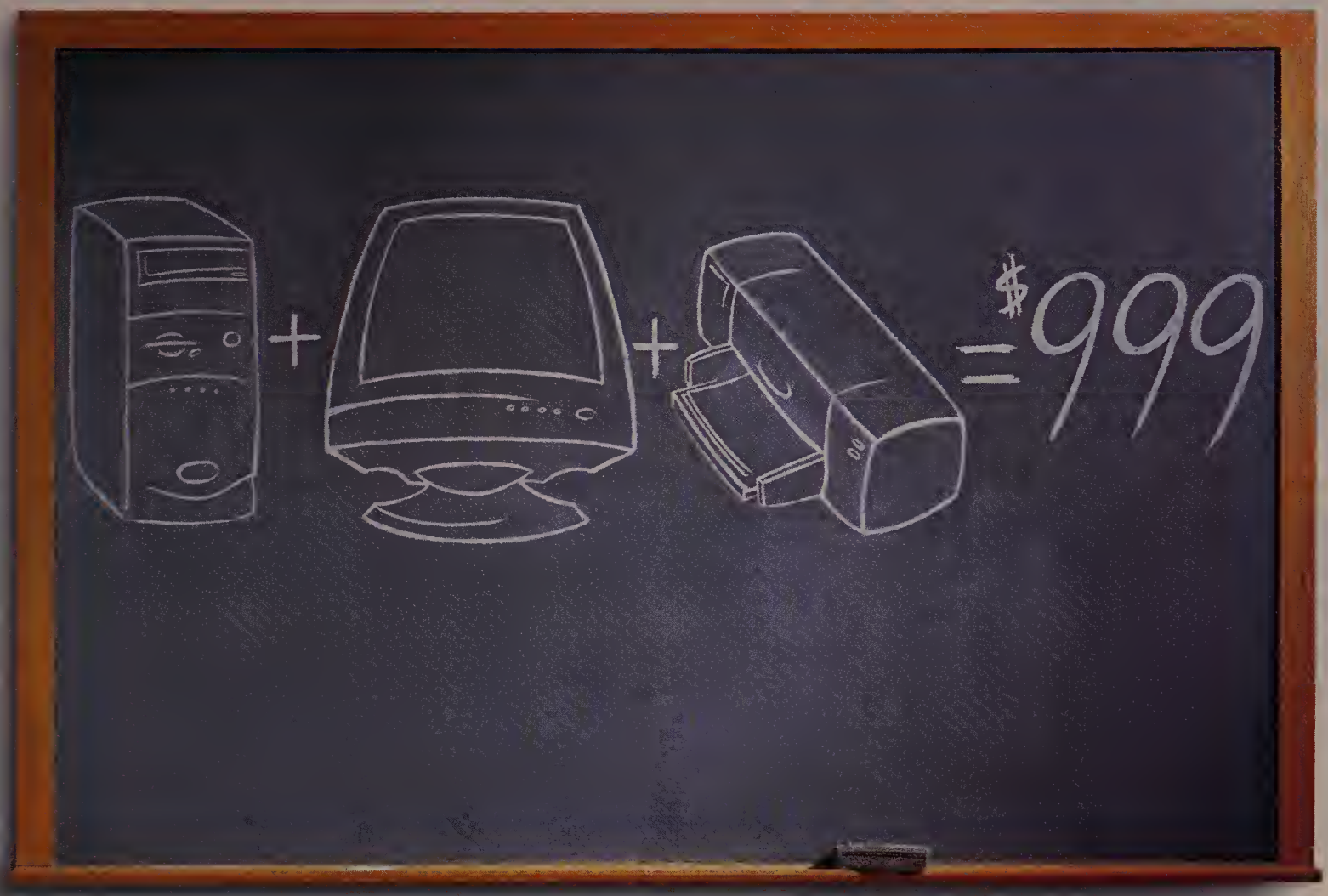

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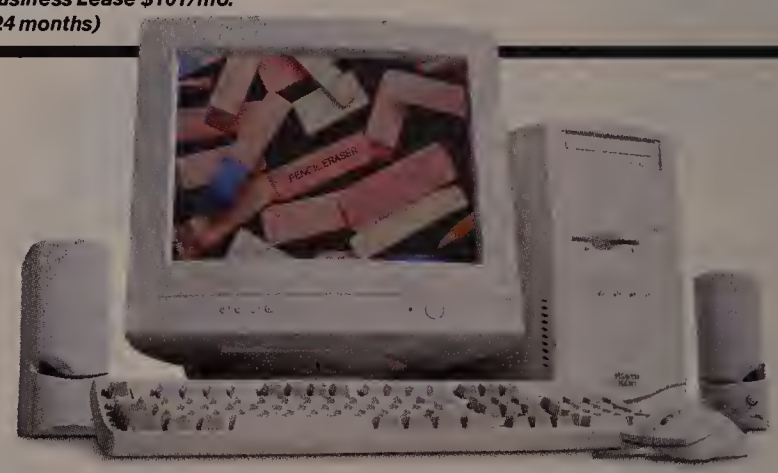

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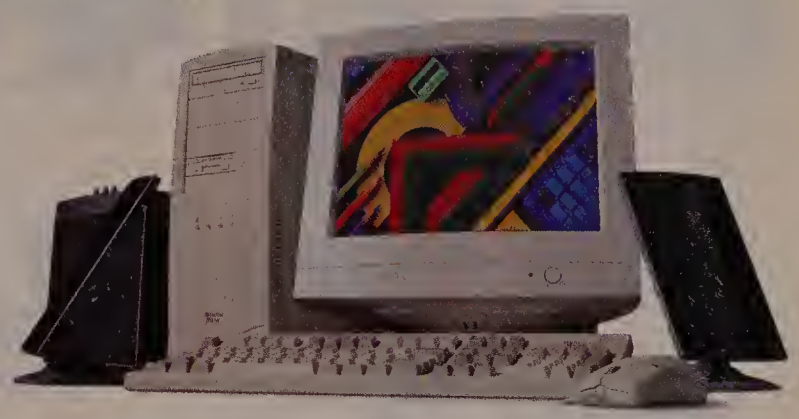

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HERE'S HOW

WINDOWS TIPS SCOTT DUNN

Make Desktop Clutter Disappear Instantly

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LOOK AT ALL THOSE ICONS strewn across your Windows desktop. Wouldn't it be great if you could make all or some of them disappear in an instant and then reappear when you need them? Or maybe you have a sensitive project—that Résumé folder, for example—you want to keep handy yet away from prying eyes. With a little preparation, you can hide any or all of your desktop shortcuts and folders (except the default icons, My Computer and Recycle Bin).

First, make sure your system will let you conceal files in folder windows. Choose *View•Options* in any folder window (Windows 95 or NT 4.0) or *View•Folder Options* (Internet Explorer 4.*x* with the Desktop Update feature, or Windows 98). Click the *View* tab and select *Hide files of these types* (Win 95 or NT) or *Do not show hidden files* (IE 4.*x* or Win 98). Then click *OK*. Note: This is a simple condition for experienced users to reverse, so don't expect this tip to provide ironclad security. Instead, use it for convenience and short-term privacy.

Next, right-click the *Start* button and choose *Open*. Somewhere within the Start Menu folder, right-click an empty area and choose *New•Folder*. Type a name for your folder and press **<Enter>**. You'll use this folder for storing your hide and unhide commands. Since it's within the Start Menu hierarchy, you can execute the commands using shortcut keys. Right-click that folder and choose *New•Shortcut*. In Windows 9*x*, type this command line: **c:\attrib +h c:\windows\desktop*.*** (your path may differ). In Windows NT, enter the following, adjusting the path as needed: **%SystemRoot%\system32\cmd.exe /c attrib +h c:\WinNT\Profiles\Administrator\desktop*.***

If you want to hide a folder, those wild cards won't do; instead, type the path and name of the folder itself. If the folder name includes spaces, put the entire path in quotation marks. For example, to hide a folder named Budget in Progress in Windows 9*x*, your command line might read **c:\attrib +h "c:\windows\desktop\Budget in Progress"**. The secret here is the attrib command, which sets the designated files as hidden (+h). Click *Next* and type a name for your command, such as **Clean Up Desktop**. Then click *Finish*.

If you want to hide some file types and not others—say, .doc and .xls files, but not .lnk, which would hide all shortcuts—enter multiple attrib command lines in Notepad (omit command.com or cmd.exe and its path, as well as the /c switch, which you need only if you want to launch a command from a shortcut without first creating a batch file) and then save the file with a name like **"hide.bat"** where you normally store batch files. Be sure to enter quotation marks around the file name when saving so that Notepad doesn't add its .txt extension by default.

For the finishing touches, right-click your new batch file or shortcut and select *Properties*. Click the *Program* tab and choose *Minimized* from the Run drop-

ILLUSTRATION: JAMES O'BRIEN

FIGURE 1: NOW YOU SEE 'EM, now you don't. Make selected desktop icons disappear with a simple batch file.

down list and make sure the box next to 'Close on exit' is checked. If desired, click in the Shortcut Key box and press a keyboard sequence to launch your command. Click the *Misc* tab and make sure the box next to 'Always suspend' is unchecked. Then click *OK*.

To create a command that undoes the hiding and makes all your icons visible again, simply repeat all the steps listed above, with these two differences: Change the **+h** switch to **-h** to remove the hidden attribute. Then give the command a different name, like **Show All Icons**.

From now on, whenever you want to hide sensitive items or clean up the desktop (see **FIGURE 1**), just choose your new command from the appropriate submenu of the *Start* menu or press your shortcut key sequence. If you don't get immediate results, try clicking the desktop and pressing **<F5>** to refresh it. Any time you need to use one of your hidden icons, use your Show All command to reverse the effect.

If you still don't get the results you want, check the location of the shortcut (not the batch file, but the MS-DOS icon you created for it) by opening the batch file's Properties. A shortcut must be on the desktop or in some menu within the Start Menu folder in order to work. Also, you must be using Windows 95 or NT 4.0. If you're using Windows 98 or have Internet Explorer 4.*x* installed, you're out of luck—Microsoft has taken away the ability to launch batch files or other DOS programs with shortcut keys. Try launching these shortcuts from the Start menu instead. If you're using Windows 95 or NT 4.0 and still experiencing problems, restarting your computer should enable your shortcut keys.

The only downside to hiding and unhiding desktop icons is that when you uncover the concealed icons in Windows 95 and NT, they don't return to their original places. In Windows 98 and IE 4.*x*, you can update the Desktop toolbar on your taskbar by simply right-clicking it and choosing *Refresh*. But getting the desktop to update its icons (with or without the Active Desktop feature) requires an act of God, or at least a change of wallpaper. Still, if you plan to hide icons for days at a time, this tip is valuable, since restarting Windows is a surefire way to refresh the desktop.

MAGIC MANAGEMENT OF MULTIPLE WINDOWS

COPING WITH A desktop full of windows can be annoying. Windows 98—and Internet Explorer 4.*x* with the Desktop Update—provides a handy Desktop button for minimizing all windows with a single click; it's in the Quick Launch portion of the taskbar next to the Start button. (If you don't see the Quick Launch toolbar, right-click the taskbar and choose *Toolbars•Quick Launch*.) But what if you want to minimize, maximize, restore, or tile some windows but not others? Or if you want to exit multiple windows at once? With Windows 98, you can accomplish these tasks in a flash. Just hold down the **<Ctrl>** key as you click buttons on the taskbar corresponding to the windows you want to work with. Then right-click one of the selected buttons and choose a command (see **FIGURE 2**). Only the selected windows will be affected.

MINIMIZE ALL BUT ONE

ALTHOUGH WINDOWS 95 and NT 4.0 don't let you selectively manage multiple windows (see previous tip), you can right-click an empty area of the taskbar and minimize, maximize, cascade, or tile all nonminimized windows. To tile or cascade some windows but not others, minimize those in the latter group first; then select the ▶

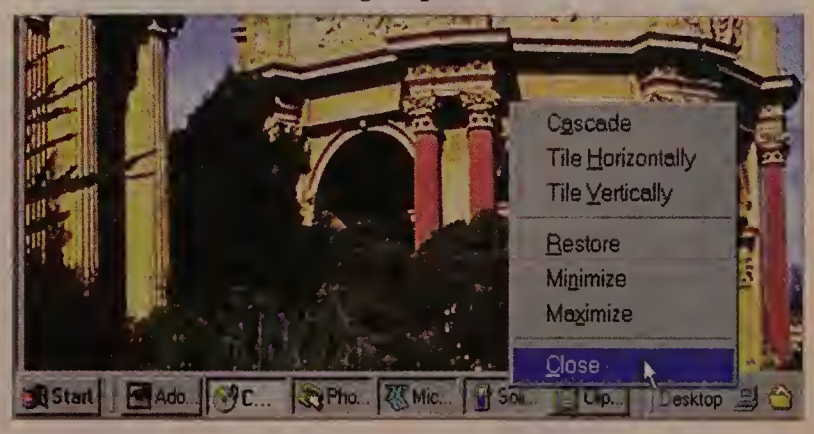

FIGURE 2: CONTROL MULTIPLE APPLICATIONS with a single command by pressing <Ctrl> as you click each taskbar button.

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command you want from the taskbar's right-click menu. To minimize all windows but one or two, here's a handy trick: In the window or windows that you want to remain on screen, choose *File•Open* or *File•Save As* or any command that opens a dialog box. Then use the right-click menu to minimize all programs. Any application with an open dialog box will not be minimized.

QUICK ACCESS TO IMPORTANT FOLDERS

WINDOWS 9*x* and NT 4.0 allow you to create shortcuts to frequently used folders and open each folder in a window of its own. Windows 3.*x* doesn't provide this amenity, but with a little ingenuity you can create "shortcuts" to frequently used directory windows and launch each on command.

In File Manager, select winfile.exe in the Windows directory and choose *File•Copy*. Type **winfil2.exe** (or any other name you want that has seven characters plus the .exe extension) and click *OK*. Now launch Windows Write and open the copy of the .exe file you just created. When prompted, click *No Conversion*. The application file will appear in the Write window displaying many illegible symbols.

When editing an .exe file like this one, be aware that you must not change the size of the file by even a single byte; any words you change must be replaced by an *equal number* of characters.

With that in mind, choose *Find•Replace*. Enter **winfile** in the Find What box and **winfil2** in the Replace With box. Click *Replace All*, but don't close the dialog box just yet. If you want to be able to use online help with your new version of File Manager, enter **winfil2.hlp** in the Find What box and **winfile.hlp** in the Replace With box, and then click *Replace All*. Again, don't close the dialog box yet. To make sure you have a unique name for your application, type **Manager** in the Find What box, and a new term of equal size, such as **Folders**, in the Replace With box. Click *Replace All* and click *Close*. This last change ensures that when you press <Alt>-<Tab> to switch between applications, you'll see a unique name—in this case 'File Folders'—in the task-switching window; having unduplicated names will help you tell the old and new File Managers apart if you happen to have them running simultaneously.

Do *not* perform global search-and-replace operations on terms containing spaces, like "File Manager." Doing so could replace line breaks and change the size of the file. Also, beware of global changes to words like "File," or you could inadvertently change the names of menus on the menu bar.

Now choose *File•Save* and exit Write. To be safe, take a look in File Manager and make sure your new application, winfil2.exe, is exactly the same size as winfile.exe. If the size is different, delete the copy and try again.

Once you've successfully made a copy of File Manager, drag the new .exe file to an appropriate window in Program Manager to create an icon for this program. For keyboard access to this version of File Manager, select the icon in Program Manager and choose *File•Properties*. Click in the Shortcut Key box, press your preferred keyboard shortcut, and click *OK*. Now launch your new version of File Manager and customize it as you please. Since the whole point is to get quick access to an oft-used directory, open a window for that directory. If you frequently drag files from this directory to specific destinations, open windows for each of those directories, and then minimize them in the File Manager window. Finally, choose a tile command from the Window menu so your main work area fills the File Folders window with the minimized drag-and-drop targets underneath.

You can repeat this tip to create as many versions of File Manager as you need, one for each directory you use often (see **FIGURE 3**). Although you can run these additional File Managers concurrently, you can't drag and drop between them. Nevertheless, these custom File Managers do give you quick access to specific directories and File Manager configurations, and they let you launch each version with its own keyboard shortcut.

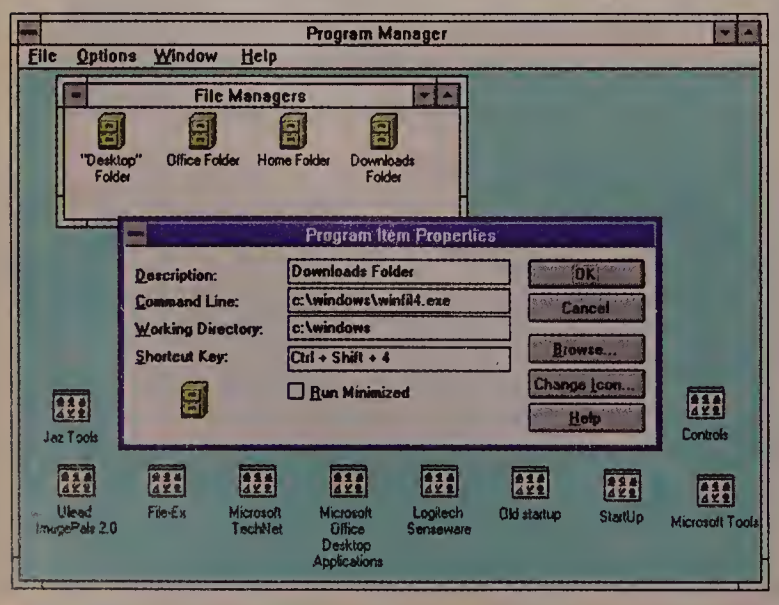
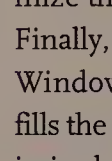


FIGURE 3: CREATE MULTIPLE VERSIONS of File Manager so you can open each directory you need with its own keyboard shortcut.



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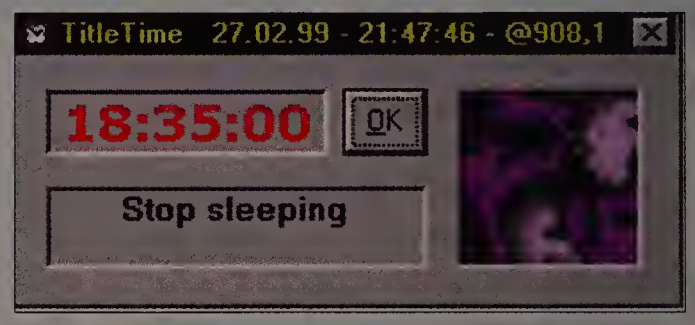

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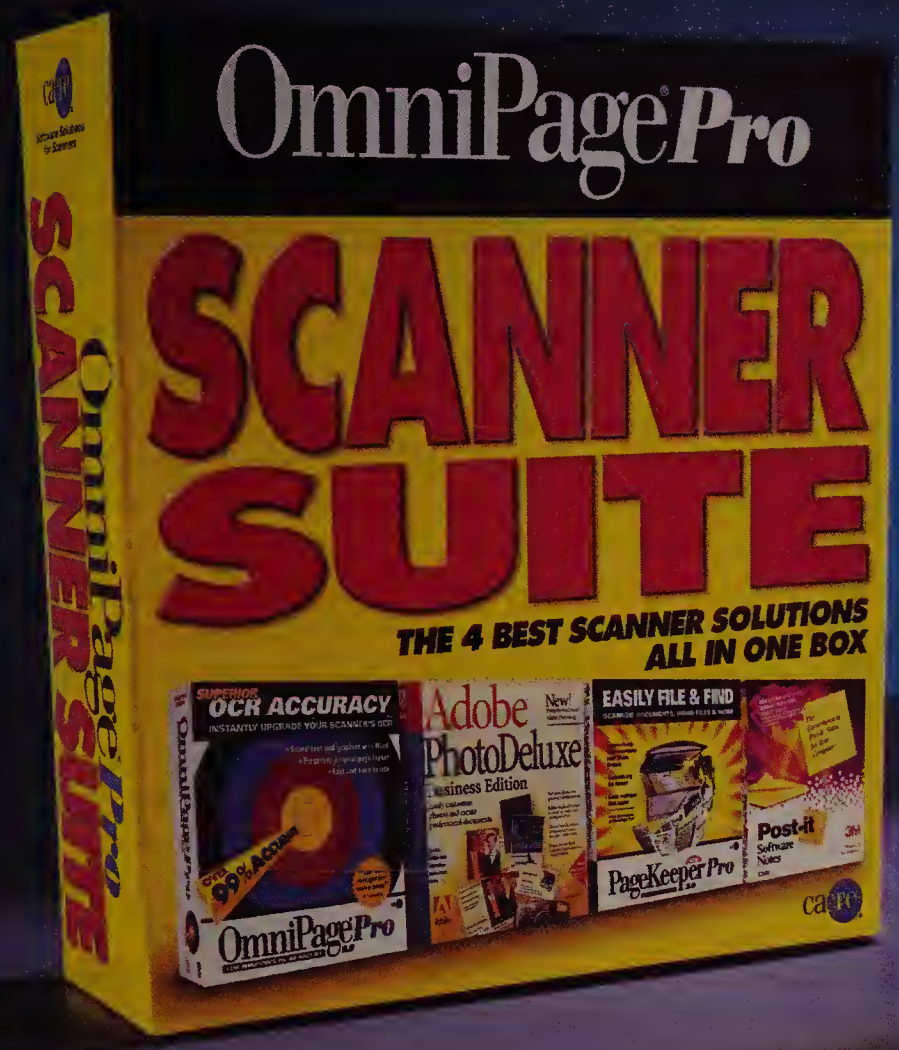

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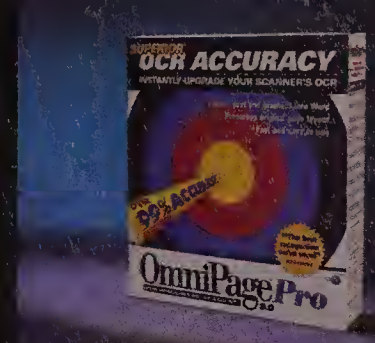

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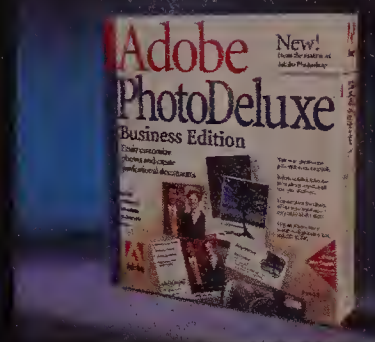

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IT'S TIME FOR another business trip. While traveling with your laptop, you realize you forgot to copy over a critical file. Sure, you could have a colleague back at the office root around your PC and e-mail the file to you. But why not dial in to the system and download it yourself instead?

Windows NT's Remote Access Service software transforms your office system into a dial-up server, letting you stay in touch with your desktop PC while on the road.

To set this service up, first log on as Administrator. Next, select *Start•Control Panel•Networking*, and pick the *Services* tab. Choose *Remote Access Services* and click *Properties*. Select the modem on which you'll receive remote access calls, and click *Configure*. Pick the *Dial out and Receive calls* option, click *OK*, then *Continue*. In the next dialog box, choose your preference of *Entire network* or *This computer only*—the former allows you to see files and printers on the network, the latter doesn't. If you plan to access the Internet through this dial-up connection, click *OK* to accept the default setting in the following TCP/IP dialog box, or click *Cancel* to skip creating TCP/IP settings. Next, click *Continue*, then *Close*, and finally *Yes* to reboot the PC and activate your new settings.

After booting, open Dial-Up Networking (*Programs•Accessories•Dial-Up Networking*), and click *New* to create a new connection. Name the new connection, click *Next* to skip the options presented in the following screen, and then choose the same modem you selected earlier and click *Next*. Click *Next* again to skip entering a phone number, and then select *Finish* to complete creating the connection.

Now choose *Programs•Administrative Tools (Common)•Remote Access Admin*, then *Users•Permissions*. Select the user account for which you want to allow dial-in access to your desktop computer (see **FIGURE 1**), check *Grant dialin permission to user*, then click *OK*. Now, start the Remote Access Service using *Server•Start Remote Access Service*. Test the service by attempting to dial in from another system. If the connection is successful and you'd like the service to start automatically each time you start up, open Control Panel's Services applet, scroll down to and select *Remote Access Server*, click the *Startup* button, and select *Automatic*. Click *OK*, then *Close*.

MAKE NT BOOT AGAIN

ADDING WINDOWS NT to a Windows 98 system is easy—just create a dual-boot configuration. But what happens if you subsequently need to reinstall Windows 9*x* or decide to upgrade to the forthcoming Windows 98 Second Edition? Unfortunately, when you boot to Windows 9*x* and then reinstall, the install program overwrites the Windows NT boot loader, and you lose the option to boot NT.

Not a problem, as long as you have the Windows NT boot disks created during setup. To repair the boot loader, place your first NT boot disk in the floppy drive, then power on or restart the PC. The Windows NT setup program will prompt you to insert disk 2, then finally present you with a Welcome screen. Press **R** to select the Repair option. Deselect the first three repair options, leaving only *inspect boot sector* selected, then press **<Enter>**. Next, you'll be prompted to insert disk 3. After locating your hard disks and CD-ROM drive, the setup program will prompt you to insert a repair disk. If you don't have one, or if yours is out of date, don't worry. Just press **<Esc>** to locate the NT folder on the hard disk and restore the NT boot loader. Follow the remaining instructions to restart the system, and voilà—you should see Windows NT's boot menu.

We welcome questions and tips and pay $50 for published items. Scott Spanbauer is a contributing editor for PC World. *See page 12 for contact information.* ■

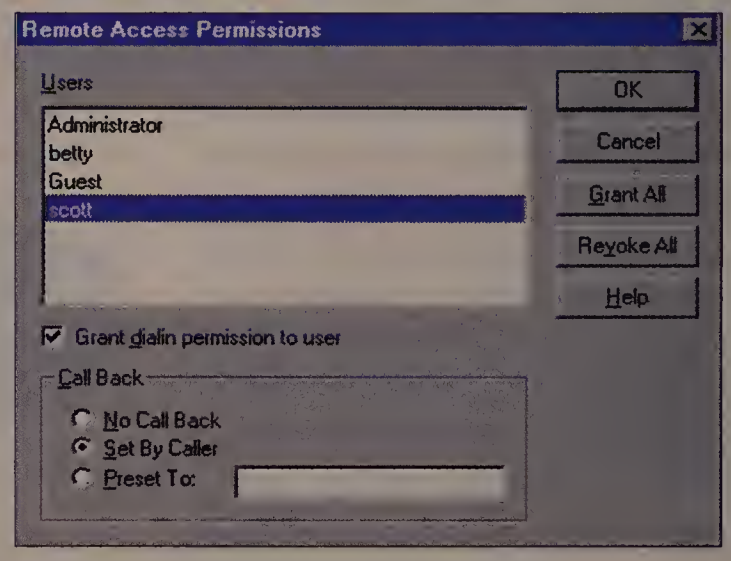

FIGURE 1: LOG ON TO YOUR OFFICE PC from the road by using Windows NT's Remote Access Service.

Have NT Call You Back

IF YOU DIAL IN to your NT system's Remote Access Service (see more at left), one of the first things you'll see after connecting is a dialog box asking if you want Windows NT to call you back. To defray the costs of calling from a hotel room, just initiate the connection, and enter your hotel room's area code and phone number when prompted. NT's Remote Access Service will disconnect briefly, then call you back, on its own dime. The only caveat: Your hotel needs to support dialing in to guest rooms, bypassing an operator.

ILLUSTRATIONS: JAMES O'BRIEN (LEFT); JEFFREY PELO (RIGHT)

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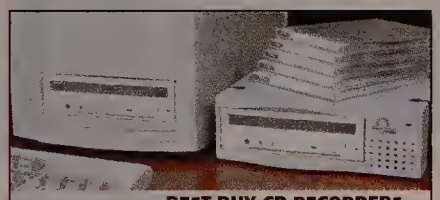

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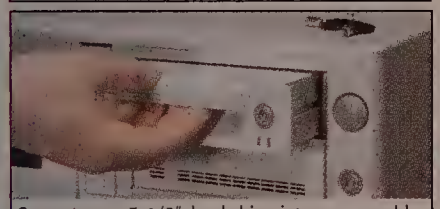

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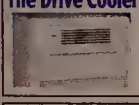

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9.1GB	7200	Quantum	XP309100S	$359
9.1G8	7200	Seagate	ST39140N	$329
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18.0GB	7200	IBM	IDGHS18Z	$719
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40X	Toshiba	XM65028	79	$64
48X	Memorex	CD48X	90	$69
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56X	Memorex	CD56X	90	$79

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9.1GB	10,000	Quantum	TN309100SCA	$520
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18.2GB	7200	Quantum	KN318200SCA	$715
18.2G8	10,000	Seagate	ST318203LC	$849
18.2GB	10,000	Quantum	TN318200SCA	$899
36.4GB	7200	Seagate	ST136475LC	$1399
36.4GB	7200	Quantum	KN336400SCA	$1349
36.4G8	10,000	Seagate	ST136403LC	$2399
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YOUR QUESTIONS ON: Y2K compliance ◆ 'Portable' Office toolbars

Make the Most of Windows' System Resources

MCAFEE'S FIRST AID program says my system resources are running low. Currently, I'm using just 1.8GB of an 8GB hard drive and running only Outlook Express in 64MB of RAM, yet resources are down to 33 percent. How can that be?

Quentin Kuttenkuler, Belle, Missouri

FIRST AID IS referring to Windows' *operating system* resources, not your hardware system's storage and memory capacities.

Windows 9*x* retains Windows 3.*x*'s system resource structure—two 64KB sections of memory that are set aside for specific jobs. The GDI (Graphics Device Interface) resources section stores fonts, bitmaps, and such for on-screen display. When applications run, portions of the User resources section go to their menu lists, window logistics, and other information. The more crowded either section gets, the more unstable Windows becomes.

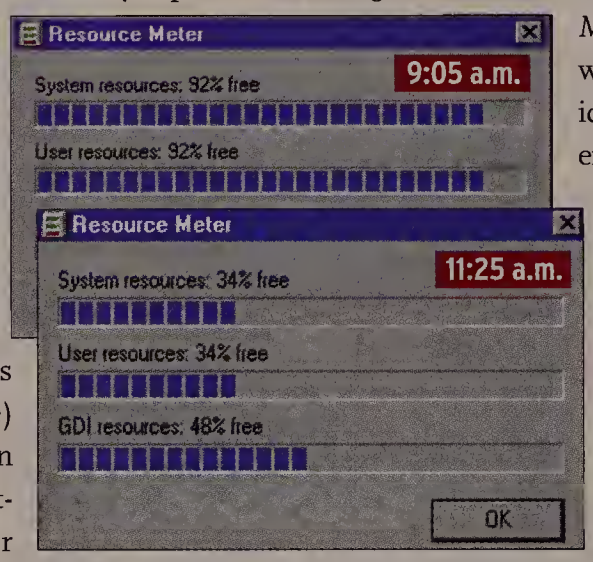


FIGURE 1: WINDOWS STARTS WITH most of its resources available. As you open apps, those OS resources start to dwindle—drastically.

Every program you open grabs some system resources, but some programs don't properly relinquish them once they've been closed. As you repeatedly enter, use, exit, and reenter apps, the amount of available resources continuously decreases (see **FIGURE 1**). The only reliable way to free up resources is to restart Windows.

Windows 9*x* comes with a tool for monitoring system resources. To access it, insert the Windows CD-ROM and click *Add/Remove Software*. In the resulting dialog box, click the *Windows Setup* tab. In the Components list, double-click *Accessories* (Windows 95) or *System Tools* (Windows 98). Then scroll down, locate, and check *System Resource Meter.*

To run Resource Meter, click *Start•Programs•Accessories•System Tools•Resource Meter,* and the meter will appear as a tray icon. Hover the pointer over that icon to see current resource levels or double-click it to keep the numbers on screen while you work. The User and GDI halves are independent and a lack of either can wreak havoc, so Resource Meter takes the percentage free of the smaller half and reports that as the percent of free system resources (see first line in Figure 1).

I DON'T WANT MY DOCUMENTS IN MY DOCUMENTS

EVER SINCE I switched to Windows 98, my apps default to storing files in C:\My Documents. I prefer another folder called C:\docs. How can I easily save files where I want them?

Kenneth J. Kahn, Lawrence, New York

IF YOU ALREADY have a data folder with another name and have shortcuts pointing to that folder, you're not likely to move everything to My Documents just to take advantage of the File•Save command's default location. And you don't have to. With the help of the Tweak UI utility, you can turn any folder on your hard drive into the default File•Save location. If you don't already have Tweak UI installed, pop your Windows 98 CD-ROM into the CD-ROM drive (don't use the Tweak UI for Windows 95/NT). In Windows Explorer, go to the CD-ROM's *\tools\reskit\powertoy* folder, right-click *tweakui.inf,* select *Install,* and follow the prompts.

Before you can designate a new default document folder, that folder must exist. If it doesn't, create it.

Then select *Start•Settings•Control Panel.* Double-click the *Tweak UI* icon, then the *General* tab. In the Special Folders section, click the Folder drop-down list and select *My Documents.* Click *Change Location* and select the folder of your choice. Click *OK* three times. You'll have to reboot for the change to take effect.

Programs that once preferred My Documents will now default to your chosen folder. Don't get upset if some of them still identify the location as My Documents—that's a phantom of the old name; the actual location is the folder you chose in Tweak UI.

STOP ANNOYING SCANS

WHEN I REBOOT my computer after it crashes, Windows always insists on running ScanDisk. Can I turn this feature off, and if so, how?

Frank Bernstein, Portland, Oregon

SCANNING YOUR drive after a crash is a good idea. If Windows doesn't shut down

More Files to Purge

IN THE APRIL issue, I listed some file types that you can safely delete (see www.pcworld.com/apr99/answers). Eric Clark of Woodbridge, Virginia, offers some additional candidates for the recycle bin. These are .shs files (scraps that you create when you drag information from an application to the desktop), .gid files (which Windows generates when you use Help and will simply re-create if they are missing), and .chk files (which accumulate whenever a ScanDisk run finds and corrects some errors).

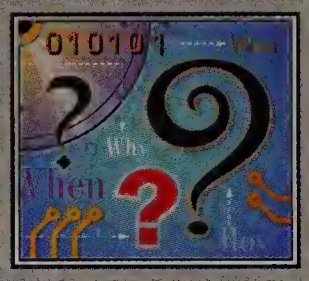


ILLUSTRATION: JEFFREY PELO

properly, you're likely to have lost clusters and other file problems that ScanDisk can catch and correct. Nevertheless, the forced scan is annoying.

The easiest way to turn this feature off is, again, with Tweak UI. If you're using Windows 95 or NT, you can download Tweak UI from www.microsoft.com/windows/downloads/contents/wutoys/nttweakui/default.asp. Windows 98 users will find it on the Windows 98 CD-ROM (see the preceding tip).

Once you've installed Tweak UI, select *Start•Settings•Control Panel*. Double-click the *Tweak UI* icon, then the *Boot* tab (if you're using Windows 98, you'll have to scroll right to find the tab). On the Autorun Scandisk drop-down list, select *Never* (see **FIGURE 2**). Click *OK*.

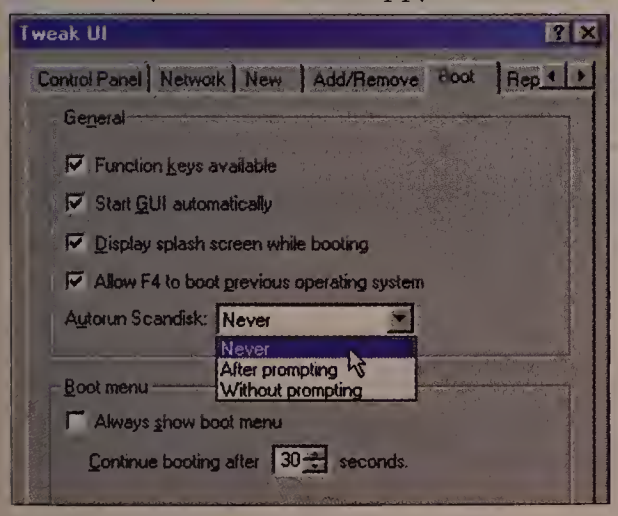


FIGURE 2: USE TWEAK UI to tell Windows not to automatically run ScanDisk after a system crash.

WHAT IF MY COMPUTER ISN'T Y2K COMPLIANT?

ACCORDING TO THE Ymark 2000 test program (available for free at FileWorld), my PC isn't ready for the year 2000. How do I fix this problem?

Desmond Gustave, Brooklyn, New York

YOU MAY NEED to upgrade your BIOS. Contact your system or BIOS manufacturer to see if an upgrade is available. If your PC was made after 1994, it most likely has a flash BIOS, which can be updated with a free download from the Web.

If no BIOS upgrade is available, you'll probably still be safe as long as you're not running a network or some obscure version of UNIX. But you should enter the new century carefully. First, make sure you have a bootable floppy before the end of the year. Insert a floppy disk—one that's blank or has no valuable data—into the A: drive, double-click *My Computer*, right-click the A: drive icon, and select *Format*. Check *Copy system files* and click *Start*. Store this disk in a safe place.

Come New Year's Eve, make sure your computer is off (hey, it will be a Friday night anyway). Before you turn it on for the first time in the new year, pop in that floppy. At the DOS prompt, type **date**. If the year isn't 2000, enter the correct date and press **<Enter>**. When the DOS prompt returns, turn off the computer.

After a few minutes, turn it back on. Chances are you'll get the right date and will continue to do so. If not, you can always reset the date after booting. But you may want to limit this computer to uses in which an accurate date is not vital—for example, word processing, games, and image editing.

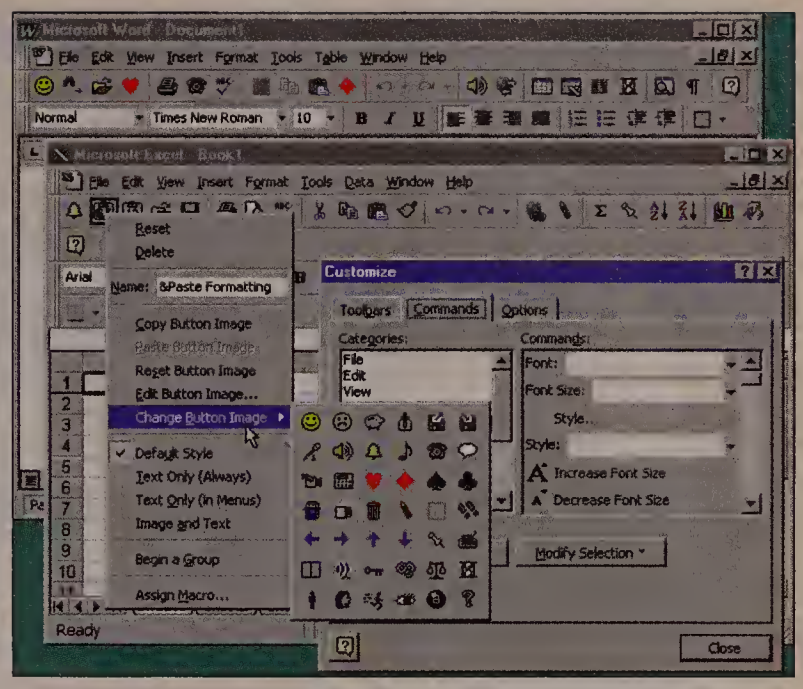


FIGURE 3: WORD AND EXCEL TOOLBARS are easily customized—you can hide or reposition them, add and remove buttons, and more.

MOVING THE OFFICE TOOLBARS

I USE EXCEL 97 and Word 97 at the office and at home, and I've customized my toolbars. Where are the files that contain those changed toolbars? I'd like to take them on a floppy from my home PC to my office PC.

Dick Maclay, Piedmont, California

WORD AND EXCEL may be in the same suite and may let you modify their toolbars in similar ways (see **FIGURE 3**), but they save toolbar information differently.

Word stores your toolbars, as well as your macros and default formatting, in a file called Normal.dot, which is usually in C:\Program Files\Microsoft Office\Templates. Moving Normal.dot is easy. Just copy it to a floppy, take it to work, and drag it to your work machine's C:\Program Files\Microsoft Office\Templates folder, clicking *Yes* when you're asked if you want to replace the existing file. (Your application paths may vary, so check each system for the location of Normal.dot. If you find more than one, load Word, select *Tools•Customize*, add an icon to a toolbar, close Word, use *Start•Find•Files or Folders* to search for **Normal.dot**; then in the results, look for the one with today's date.)

In Excel, the file in question is probably in C:\Windows and is probably called Excel8.xlb or *yourname*8.xlb. (Your home system may have more than one. Launch Excel and change something on your toolbar. Then exit Excel, use Find to search for *.xlb, and locate the one with today's date. That's the file you want to copy from your home machine.)

You can copy this file to a floppy easily enough, but making sure it works on the other machine is tricky. Before you copy the file to your office PC, launch Excel on that system and use the steps given above to find the right toolbar file on it.

The two file names must match, so, if necessary, rename the .xlb file on your floppy (in Explorer, right-click the file and select *Rename*) to match the name of the toolbar file on the office PC. Now you can simply drag the toolbar file from the floppy to the proper folder on the office system and answer *Yes* when asked to confirm replacing the file.

Find files from this article at www.fileworld.com/magazine. We pay $50 for published questions and tips. Lincoln Spector is a PC World *contributing editor.* *See page 12 for contact information.* ■

Set up e-mail autoreply ◆ Add download tricks to your routine ◆ Rewrite history

Get Your E-Mail Box Ready for Vacation

YOU'VE SUSPENDED newspaper delivery, turned down the water heater, and left extra birdseed in the feeder. Your neighbor has agreed to break a couple of federal laws and pick up letters and catalogs from your mailbox. But what about your e-mail? Before you head out for a week on the beach, follow these tips to keep your e-mail pen pals informed of your whereabouts (or at least whenabouts).

Set up autoreply. Some Internet service providers let you issue automatic "I'm away" responses to incoming mail. Ask your ISP's tech support if it offers the service, and if so, how to set it up. Be sure your autoreply says when you'll return and whom to contact with urgent problems.

Get free e-mail. Some free Web-based e-mail services like Yahoo (mail.yahoo.com) also offer autoreply messages. As an added bonus, you can use these services to access your "regular" (POP3) mail while you're traveling.

Unplug. Thunderstorms have been known to hurl power surges down upon phone lines, and these can fry both your modem and your PC. So before you leave, unplug the phone cord as well as the PC.

Get the right numbers. If you plan to take your laptop with you so you can log on from the hotel room (what's wrong with you, anyway?), make sure your dial-up-networking applet (or your AOL setup) is configured with local numbers. This is best handled ahead of time, while you're still at home, so you can search for dial-up numbers without having to pay long-distance toll charges.

OUTLOOK SPAM FILTER

IN LAST February's *Internet Tips* (www.pcworld.com/feb99/hh_internet), I wrote that Outlook Express won't let you create a filter for deleting messages when your e-mail address does not appear in the 'To:' field. (Spams are often addressed to "undisclosed recipients.") Outlook Express 5 remedies that deficiency. Select a message and go to *Message•Create Rule From Message*. In the first category, check *Where the To line contains people*. Under 'Select the Actions for your rule', check *Move it to the specified folder* (see **FIGURE 1**). You could set Outlook Express to delete the message from your ISP's server and not download it, but it's safer to set up a junk folder that you can review—in case an important e-mail from your boss comes addressed to you in a mailing list of multiple recipients. Under Rule Description, click *contains people* and enter your e-mail address. Click *Add*, then *Options*. You'll get a pop-up box called Rule Condition Options. Under 'Apply rule if', select *Message does not contain the people below*. Click *OK* twice. Back under Rule Description, click *specified*, select or create the folder where you want your nonpersonal mail dumped, and click *OK* twice. Setting up such a filter does have one drawback: If you subscribe to a discussion group, all the messages from that group may end up in your junk folder.

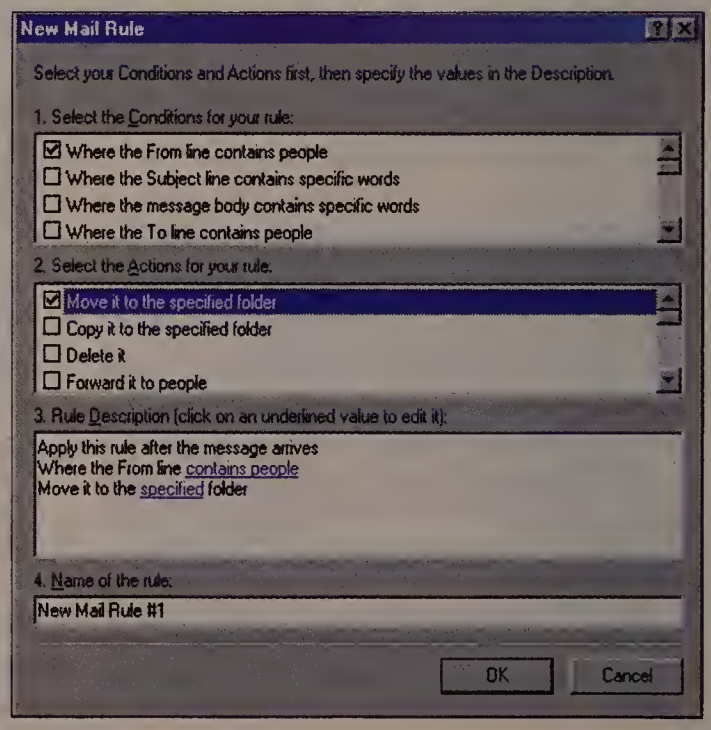


FIGURE 1: BLOCK SPAM in Outlook Express 5 by creating a rule to identify and reroute messages sent to mailing lists.

SOLVE DOWNLOAD PROBLEMS

YOU'RE DOWNLOADING software when suddenly your PC loses the connection to your Internet service provider or your download rate slows to a glacial pace. Don't have a conniption. Next time, try these tricks for downloading software smoothly and quickly:

Resume lost downloads. Few PC misadventures are more galling than losing your connection halfway through a 5-hour download. But if the file server supports download resume and you're using IE ▶

Customize Browser Toolbars

RANDY CHANG of Berkeley, California, reminds us that we can customize the personal toolbar in Communicator or the Links bar in IE by adding icons for frequently visited URL and folders of bookmarks.

In Communicator, drag a link from a Web page to the personal toolbar. To add a folder, click the *Bookmarks* icon, select *Edit Bookmarks*, and highlight the folder you wish to place on the toolbar. Right-click and select *Set as Toolbar Folder*. In IE, drag folders or links and drop them onto the Links bar.

ILLUSTRATIONS: JAMES O'BRIEN (LEFT); JEFFREY PELO (RIGHT)

4.*x* or later, just log back on and restart the file transfer. IE will pick up where it left off, even if a week has passed since the disconnect. You can give Netscape Navigator (as well as earlier versions of IE) the same capability with the $18 shareware plug-in GetRight (see **FIGURE 2**), available from www.getright.com or FileWorld.

Thwart autodisconnects. If your ISP hangs up after a period of inactivity, you can keep it from disconnecting during long file downloads by setting your browser or e-mail program to check for mail at regular intervals. In Communicator 4.*x*, select *Edit•Preferences*. Expand the *Mail & Newsgroups* category and highlight *Mail Servers*. Under Incoming Mail Servers, select your mail server and click *Edit*. Under the *General* tab, place a check beside *Check for mail every* and enter **10** (for 10 minutes). Click *OK*. In Outlook Express, select *Tools•Options* and select the *General* tab. Click next to *Check for new messages every* and type **10**. Click *OK*. In situations where mail checks disrupt the file download, disable the feature.

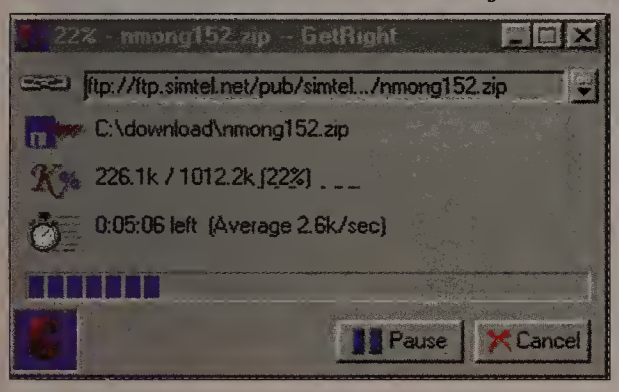


FIGURE 2: GETRIGHT WILL RESUME botched downloads and help you find the fastest server.

Connect via FTP. File transfer protocol downloads are faster than HTTP (browser-based) downloads. Use FTP software like CuteFTP (shareware, available from www.cuteftp.com or FileWorld) to connect directly to the file collection's FTP server (see **FIGURE 3**). Log on as **anonymous** and type your e-mail address as a password. If you're not sure where to go next, look for a Pub directory, where many software vendors put downloadable software.

Avoid rush hours. The Net suffers rush hours just like freeways do, and when it does, things crawl. If you've ever gotten the message 'There is no response. The server could be down or is not responding', the server may be overwhelmed with download requests. Try downloading early in the morning or late at night. If you can't burn the midnight oil, use GetRight to schedule downloads. If you are downloading from AOL forums, schedule the downloads by placing the files in your Download Manager while you are online. Then head to the Mail Center and select *Set Up Automatic AOL (Flashsessions)*. Place a check beside *Download files marked to be downloaded later*. Click *Select Names*, select the screen name you wish to use, and enter its corresponding password. Click *OK*. Finally, click the *Schedule Automatic AOL* icon to set the time and day of the download.

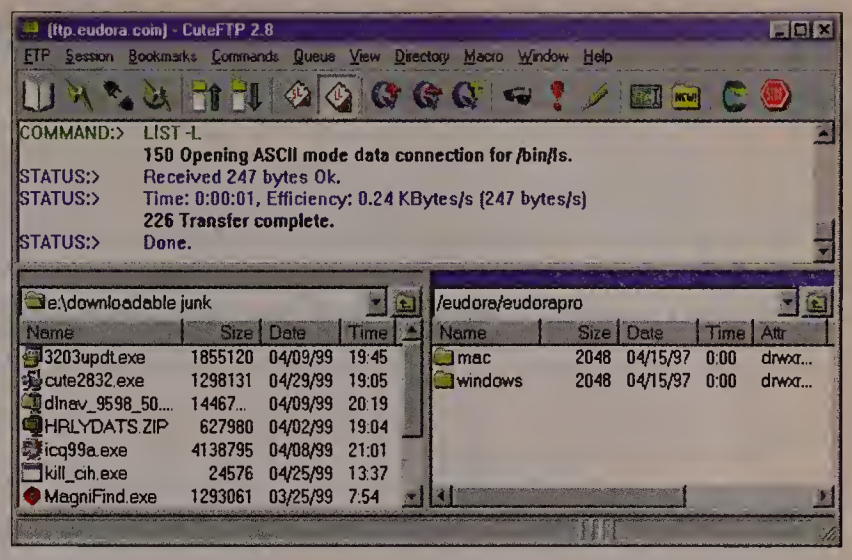


FIGURE 3: FOR SUPERFAST DOWNLOADS, use CuteFTP to tap directly into software vendors' file transfer protocol sites.

Ping it back alive. Sometimes a download may appear to freeze. Occasionally it'll halt long enough that your browser will give up waiting. This problem occurs more often with big downloads and busy servers. If you're baby-sitting a download and notice that it has halted, click *Start•Run* and type **ping *server***. For example, if you want to check out the status of Eudora's server, type **ping ftp.eudora.com**. Ping, which stands for Packet Internet Groper, is a message one computer sends to another over an IP network to make sure the other system's still alive. If you want to send a regular string of wake-up pings to the server, go to the DOS prompt (*Start•Command*) and type **ping -t *server***.

CLEAR YOUR HISTORY

JOHN V. RUTIGLIANO of Somerset, New Jersey, wants to know how he can get rid of the URLs from his browser's drop-down location box. Since your browser can store only a limited number of URLs in that box (18 in Navigator 4.5, 25 in IE 5), a simple way to "fill up" the box is by typing a single character and then pressing **<Enter>** again and again until your URL list is, well, history.

A quicker way, in Navigator 4.5, is to select *Edit•Preferences*. Select *Navigator* on the left, and in the box on the right, select *Clear Location Bar•OK*. If, when you reload Communicator, your URLs reappear in the drop-down box, the browser is pulling them out of the Registry thanks to some old installation of the browser. From Windows' *Start* menu, select *Run*, type **regedit**, and press **<Enter>**. Click your way to HKEY_CURRENT_USER/Software/Netscape/Netscape Navigator/URL History. On the right side of the screen, click the *Name* column and delete the information in the Value data field. Click *OK*. You also must clear the URLs from prefs.js (that's how you'd clear URLs from the drop-down box in older versions of Communicator). Open the file in any text editor (it's usually in C:\Program Files\Netscape\Users*yourname*); then look for lines that start with 'user_pref("browser.url_history', and delete those lines.

In IE 5, select *Tools•Internet Options*, and under the *General* tab, click *Clear History*. To prevent Explorer from storing any URLs—in case you want to keep your boss from finding out which Web sites you've visited at work—set 'Days to keep pages in history' to **0**, and click *OK*.

Find files from this article at www.fileworld.com/magazine. We welcome your questions and tips and pay $50 for published items. Contributing Editor Judy Heim is coauthor of The Quilter's Computer Companion *(No Starch Press, 1997).* *See page 12 for contact information.* ■

Change header/footer fonts ◆ Import data with ease ◆ Print on any printer

Macros: The Power and the Gory

THERE'S NO DENYING the unsurpassed power of Visual Basic for Applications macros in Word (and elsewhere in Microsoft Office), but this very power permits the spread of macro viruses. Word 97 and 2000 can store macros inside documents and allow them to run automatically when you open or close a document. Last April's outbreak of the Melissa virus—carried by e-mail attachments—called attention to the damage macro viruses can do, and the importance of protecting against them. Here's what you can do:

Use Word's macro virus protection. To confirm the built-in system is working in Word 97, select *Tools•Options*, and click the *General* tab in the Options dialog box. Make certain the Macro Virus Protection box is checked, then click *OK*. In Word 2000, Select *Tools•Macro•Security*, select either *High* or *Medium* on the Security Level tab, (see **FIGURE 1**), and then click *OK*.

Disarm booby traps. When you open a document containing a macro, you'll see the dialog box shown in **FIGURE 2**. Unless you're sure the macro is safe, pick *Disable Macros* or *Do Not Open*. If you opt to select Disable Macros, Word 97 will respond by opening the document as a read-only file; to save it after editing, you'll have to use *File•Save As*. Word 2000 lets you save the document after editing but removes the macro when you do. In Word 97, do not remove the check mark from the 'Always ask' check box—doing so disables default virus protection for all documents. (This option is not available in Word 2000.)

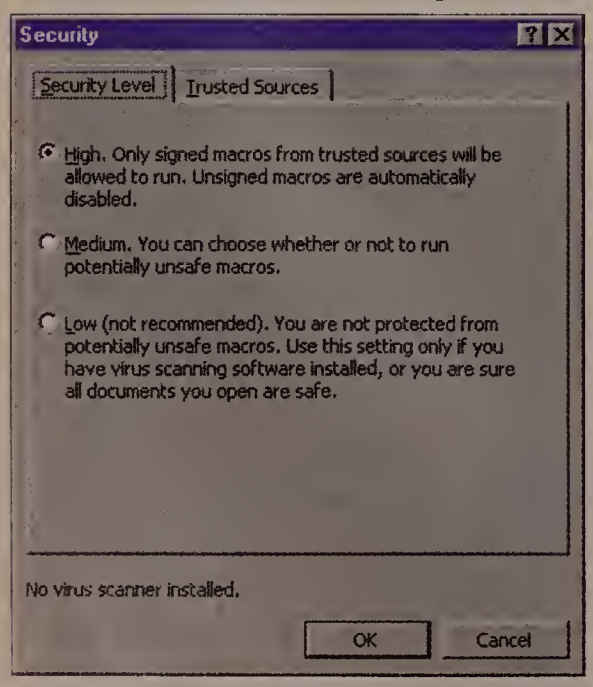


FIGURE 1: IN WORD 2000, High security protects you against all macros not from sources you name.

Don't open the door to strangers. Know the source of your documents. If you're unfamiliar with the source, don't open the document.

Keep yourself up-to-date. Get the latest valuable downloads and information on macro virus protection by regularly visiting Microsoft's Office Update site (officeupdate.microsoft.com).

Don't let down your guard. Not all virus protection programs are capable of catching Word viruses. In our experience, however, Symantec's Norton Anti-Virus handles them fairly smoothly.

Note for WordPerfect users: Because WordPerfect doesn't automatically execute macros when it loads a document and doesn't store macros within documents, opening WordPerfect documents presents almost no risk of virus infection.

Quick Document Info

NEED TO KNOW the total number of pages in a long Word 97 or 2000 document? Just look at the status bar in the lower left corner. But if you want even more information, including the number of words, paragraphs, lines, and characters in your current document, select *Tools•Word Count*. But wait, there's more: This handy command can also deliver the same information about any selected part of your document. Highlight the section you want to check, then select *Tools•Word Count*.

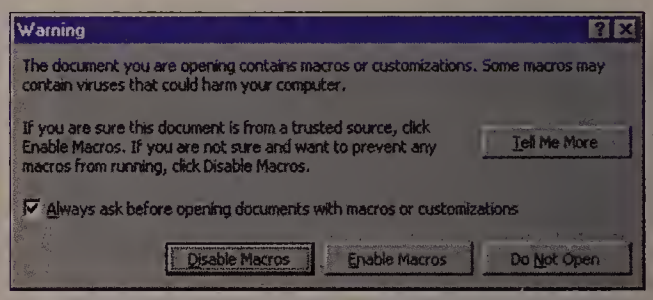


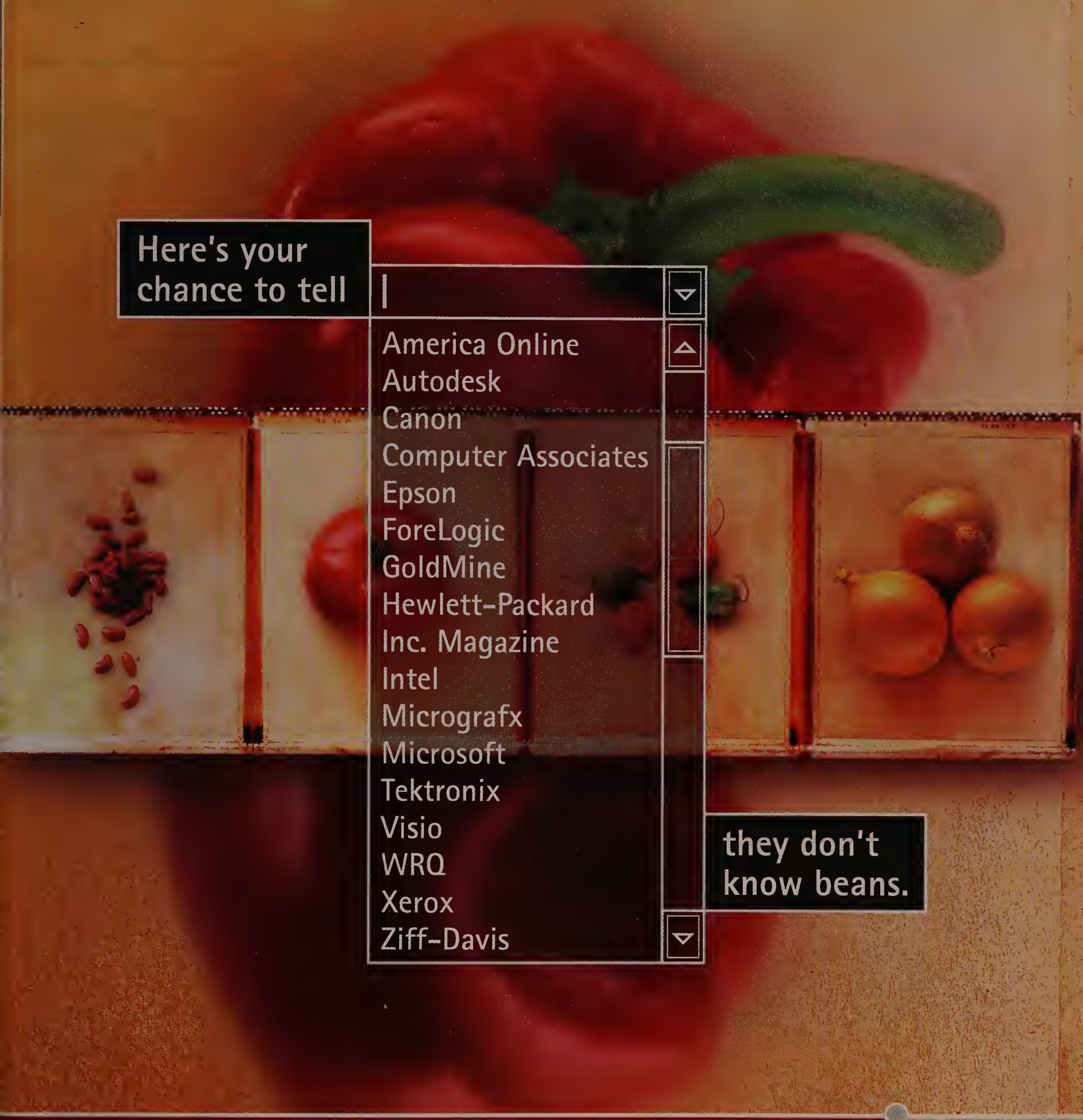
FIGURE 2: WORD WARNS YOU when you are about to open a document that contains a macro.

EIGHT STEPS TO MAKE WORD'S TABLE DATA PORTABLE

MANY WORD USERS create tables for addresses or other data. They're very convenient, especially if Word is your primary application. But sometimes you'll want to export that data for use in other applications, like databases or personal information managers. Word can quickly convert a table into delimited text, which almost all database applications can import:

1. Check the text in the table's cells for commas. Before converting, add quotation marks at the beginning and end of the text in each cell where commas appear. This move prevents errors when importing the data into another application.
2. With the cursor in the table, select *Table•Select Table*.
3. Position the cursor in the table and select *Table•Select Table*.To avoid altering the existing document, copy the table to the Clipboard (<Ctrl>-C), open a blank new document (<Ctrl>-N),and paste the table into the new document (<Ctrl>-V).
4. Select the table again, as in step 1.
5. Select *Table•Convert Table to Text*.
6. In the Convert Table to Text dialog box, select the *Commas* option, then click *OK*.
7. Save the resulting document, choosing *Text Only* in the 'Save as type' list in the Save As dialog box.
8. Use the other program's import features to import the file. ▶

ILLUSTRATION: JEFFREY PELO



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For more information, contact Kate Potts @ 972-994-6413 or visit | www.micrografx.com/chili/nobeans

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MICROGRAFX CHILI FOR CHILDREN. A RECIPE FOR HOPE

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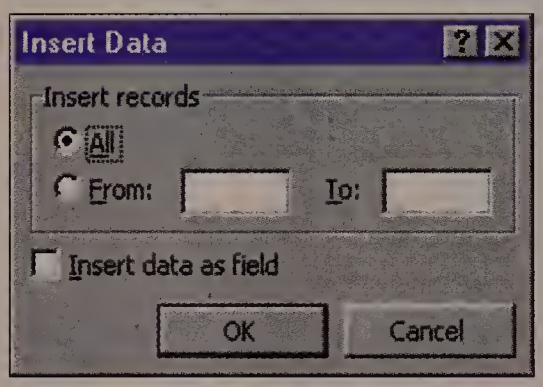
THE INS AND OUTS OF IMPORTING DATA

BRINGING DATA from a database into a Word table is a common task for many users, whether to import an address book from a PIM or an inventory database from another program. Here's how:

1. In the other program, export the data as a comma-delimited file, using that program's export tools.
2. In Word, place the cursor where you want the table to appear.
3. In Word 6 or 7, select *Insert•Database*.

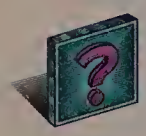
In Word 97 or 2000, select *View•Toolbars*, then display the *Database* toolbar, and finally click the *Insert Database* icon.

4. In the Database dialog box, click *Get Data*. Then, in the Open Data Source dialog box, choose the file you created earlier and click *Open*.
5. Back in the Database dialog box, click *Insert Data*. If you wish, use the *Query Options* or *Table AutoFormat* buttons to adjust the data before clicking *Insert Data*.
6. When the Insert Data dialog box appears, either click *OK* at once (to import all



records) or specify the starting and ending record numbers before clicking *OK*. Word will create a neat table containing the data.

CHANGE DEFAULT FONTS FOR HEADERS AND FOOTERS



HOW CAN I change the default fonts that Word uses for text in page headers and footers?

Jack Fowler, Daly City, California

THE PROCESS IS easy but not obvious (see **FIGURE 3**). To change the default for any of Word's styles—including Headers and Footers—just follow these steps. The method works for Word 7, 97, and 2000:

1. Select *Format•Style*.
2. Under List, in the Style dialog box, select *All styles*.
3. From the choices offered in the *Styles* list, choose *Header* or whatever style you want to alter.
4. Click *Modify*.
5. In the Modify Style dialog box, select *Add to template*, then click the *Format* button and select *Font* from the menu that appears.
6. Change the font in the standard Font dialog box, and then click *OK* in both the Font dialog box and the Modify Style dialog box.
7. Repeat steps 3 through 6 for any other styles you want to modify. Click *Close* in the Style dialog box to finish the job.

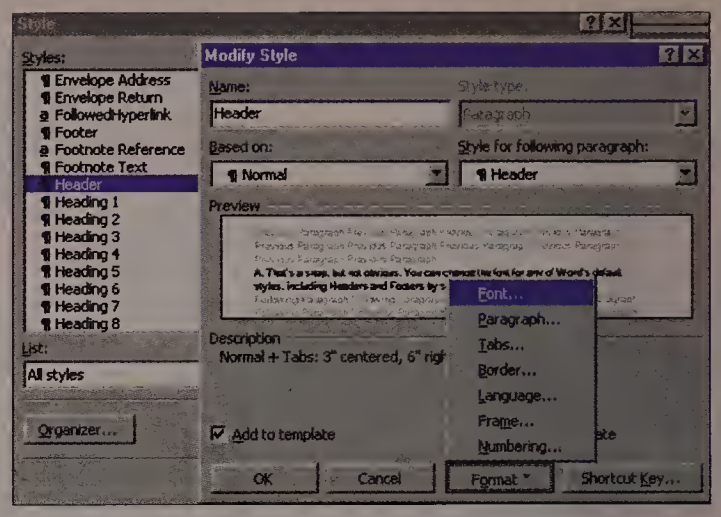
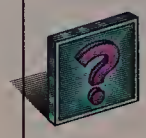


FIGURE 3: YOU CAN CHANGE the default font for any style in Word, using the Style and Modify Style dialog boxes.

PRINT A FORMATTED TEXT DOCUMENT ON ANY PRINTER



I CREATE LONG documents in Word 97, which are then sent to a mainframe computer for printing on a line printer. Is there a way to preserve pagination, headers, footers, and other document formatting while producing a pure ASCII text document the mainframe can understand?

David Smith, Camp Hill, Pennsylvania

YES, AND THE correct technique to use works in Word and WordPerfect, as well as in most other Windows programs. You need a generic text printer driver, which Windows fortunately provides. The driver preserves your documents' margins, columns, headers, footers, and footnotes, but uses the printer's default font. Here are steps for installing the driver and instructions for using it:

1. On the Start menu, pick *Settings•Printers*.
2. Double-click the *Add Printer* icon; click *Next*, choose *Local* or *Network*, and click *Next* again if you're on a network. Choose *Generic* from the Manufacturers list, and click *Next*.
3. Select *File* from the 'Available ports' list in the next window, and click *Next*.
4. In the next window, leave 'Printer name' alone. Since you probably don't want this to be your default printer, make sure the *No* button is selected. Click *Next*.
5. Click *No* when asked if you want to print a test page, then click *Finish*.
6. If prompted to do so, insert the Windows 95/98 disk.

Once this Generic/Text printer driver is installed, you can create documents that use it. Here's what to do:

1. In a new or existing document, select *File•Print*. In the Print dialog box, select *Generic/Text* from the Name list, and click *Close*. You will get a Window requesting a file name that ends with the .prn suffix. Click *Close*, and your document will reformat for the new driver or set up a new document for this driver, providing a fair representation of the finished product.
2. When you've finished editing the document, select *File•Print* again and click *OK*. Windows will prompt you for a file name. Supply one, and click *OK*. The resulting file will be a formatted version of your document, suitable for copying directly to most generic printers. You may have to experiment with the printer driver's settings, however, to get just the result you want. To do this, select *Properties* in the Print dialog box.

To print from another PC that does not have your printer drivers, go to the DOS prompt. Then type **Copy** *filename.ext* **PRN /b**, where *filename.ext* is the name of the file. Depending on the printer, you may have to press its Form Feed button to eject the last page, but probably not.

You can find additional tips at www.pcworld.com/heres_how. We welcome your questions and tips, and pay $50 for published items. George Campbell is a contributing editor for PC World. *Reach him via his Web page at www.osomin.com, or see page 12 for contact information.* ■

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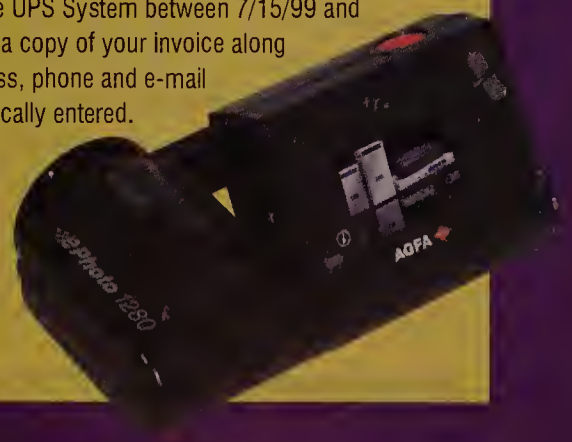

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Importing Text Is Easier Than Ever in Excel 2000

EXCEL USERS HAVE long envied 1-2-3's ability to insert the contents of a text file into a worksheet. Until Excel 2000, all versions of Excel required you to open the text file separately, then copy and paste the data to your worksheet.

Excel 2000 makes the process a bit easier, if not quite a snap. You might expect to see this feature on the File menu, but instead you select *Data•Get External Data•Import Text File*. This command calls up a dialog box in which you select a text file, whereupon the Text Import Wizard lets you specify how Excel should import the data. Finally, in the Import Data dialog box (see **FIGURE 1**), you indicate the desired worksheet destination.

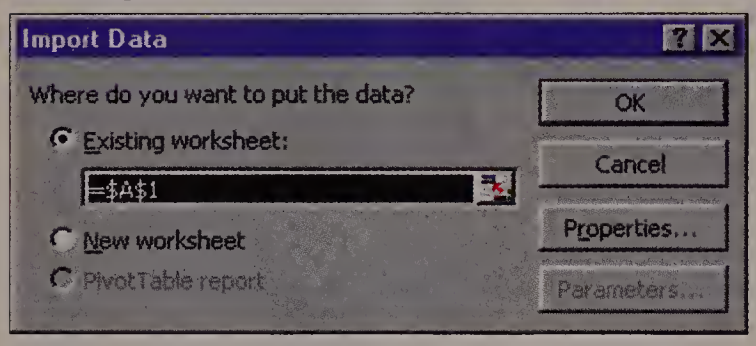

FIGURE 1: EXCEL 2000's Import Data dialog box enables you to specify the destination for a text file you want to import.

Excel imports the text file as a database query, which you can update if the data in the text file changes (select *Data•Refresh Data* to do so). To import the file as static data, click *Properties* in the Import Data dialog, and remove the check mark from the *Save query definition* box.

ZAP HYPERLINKS IN EXCEL 2000

YOU MAY HAVE discovered that Excel 2000 supports automatic cell hyperlinks. Whenever you type something that resembles a URL or an e-mail address into a cell, this feature automatically converts the text into a clickable hyperlink. But what if you don't *want* to create a hyperlink?

I have not yet unearthed a way to turn off Excel's automatic hyperlink feature, but you can override it. If Excel creates a hyperlink from your cell entry, click the *Undo* button (or press **<Ctrl>-Z**) to restore the cell's contents to normal text.

Surprisingly, Excel doesn't provide a direct way to remove all hyperlinks on a worksheet. In fact, the only way to accomplish this is one cell at a time: Activate the cell that contains the hyperlink, right-click, and then select *Hyperlink•Remove Hyperlink*. Unfortunately, this command is available only when you have selected a single cell. To quickly deactivate all hyperlinks, you need to use a macro: Press **<Alt>-<F11>** to activate the Visual Basic Editor, select *Insert•Module* to insert a new VBA module into your project, and then enter the following code:

```
Sub ZapHyperlinks()
Cells.Hyperlinks.Delete
End Sub
```

When you execute the ZapHyperlinks macro, all hyperlinks on the active sheet are deleted and replaced with normal text.

A USEFUL CIRCULAR REFERENCE IN 1-2-3

WHEN SPREADSHEET users hear the term *circular reference*, they immediately think of an error condition. Most of the time, a circular reference occurs by accident—it's a formula that refers to itself. But circular references can serve a useful purpose. For example, to sum the values in range A1..A10, you could enter @SUM(A1..A10) in cell A11. But if you inserted a new row directly above row 11, you would need to change the formula so the sum included the new row: @SUM(A1..A11). To eliminate the need to change your formula when you insert a new row above the SUM formula, use this formula in cell A11: **@SUM(A1..A11)-A11**. The circular reference produces a result that's larger than it should be, but then the result is subtracted from itself so in the end it displays the correct answer. The advantage, of course, is that the references in this formula adjust automatically when a new row is inserted above the formula.

Make Your Dates Y2K-Ready

WHEN YOU type a date into a cell, Excel probably displays it with a two-digit year, such as 8/15/99. If you want all new dates you enter to have four-digit years (a good move for Y2K readiness), you must change the default date format. Excel uses Windows' systemwide setting as its default. To change this, select *Start•Settings•Control Panel•Regional Settings*. Click the *Date* tab, and choose a different format from the 'Short date' style list (see **FIGURE 2**). Date styles that contain *yyyy* will display four-digit years.

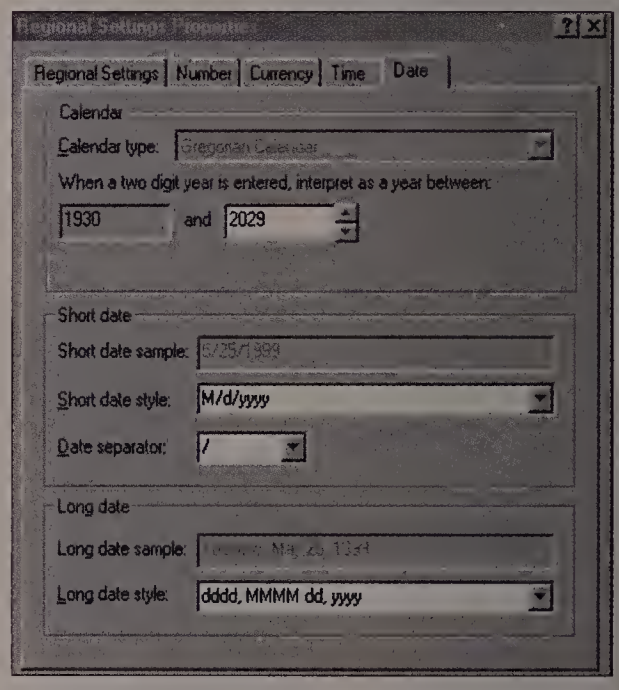

FIGURE 2: YOU CAN set four-digit years in Windows' Regional Settings panel to handle Y2K readiness.

online

For more tips, visit www.pcworld.com/heres_how. We welcome tips and questions and pay $50 for published items. Contributing Editor John Walkenbach is the author of the Excel 2000 Bible *(IDG Books, 1999) and maintains The Spreadsheet Page (www.j-walk.com).* *See page 12 for contact information.* ■

ILLUSTRATION: JEFFREY PELO

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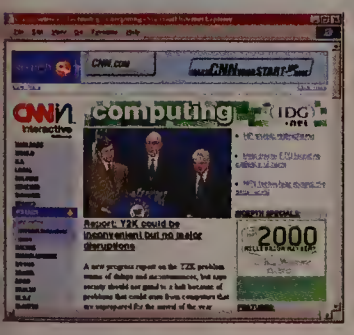

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Install a Removable-Media Drive

THANKS TO THEIR large capacities, portability, and the simple but effective security they provide, removable-media drives have become one of the most popular types of storage devices. Using one, you can keep your company or personal financial data on removable cartridges or disks, and lock them away or take them with you at the end of the day. These disks are also handy media on which to store copies of important data or even some smaller, regularly accessed files (reserving the space on your main hard drive for megabyte-hogging audio, video, or graphics files). And the ubiquity of removable-media drives (and their media) makes them a great way to exchange files that are too large to e-mail to friends or colleagues.

Choices in removable-media drives have expanded in the last year. Iomega's 100-MB and 250MB Zip drives are still the most widely used, followed closely by the company's high-performance, 2GB Jaz drive. But other contenders include SuperDisk (or LS-120) drives—available from a number of manufacturers—that offer 120MB of storage on floppy-size media. And Castlewood's new high-performance Orb drive stores 2.2GB on low-cost cartridges (see June's "Floppy Killers?" www.pcworld.com/jun99/removable).

Regardless of the specific removable-media drive you choose, external ones that hook up to your PC's Universal Serial Bus port or parallel port are the easiest to install and offer the most portability. But if you can get through the installation process, internal drives—IDE or SCSI—are faster and are more convenient to use. Here's how to install both kinds of internal removable-media drives.

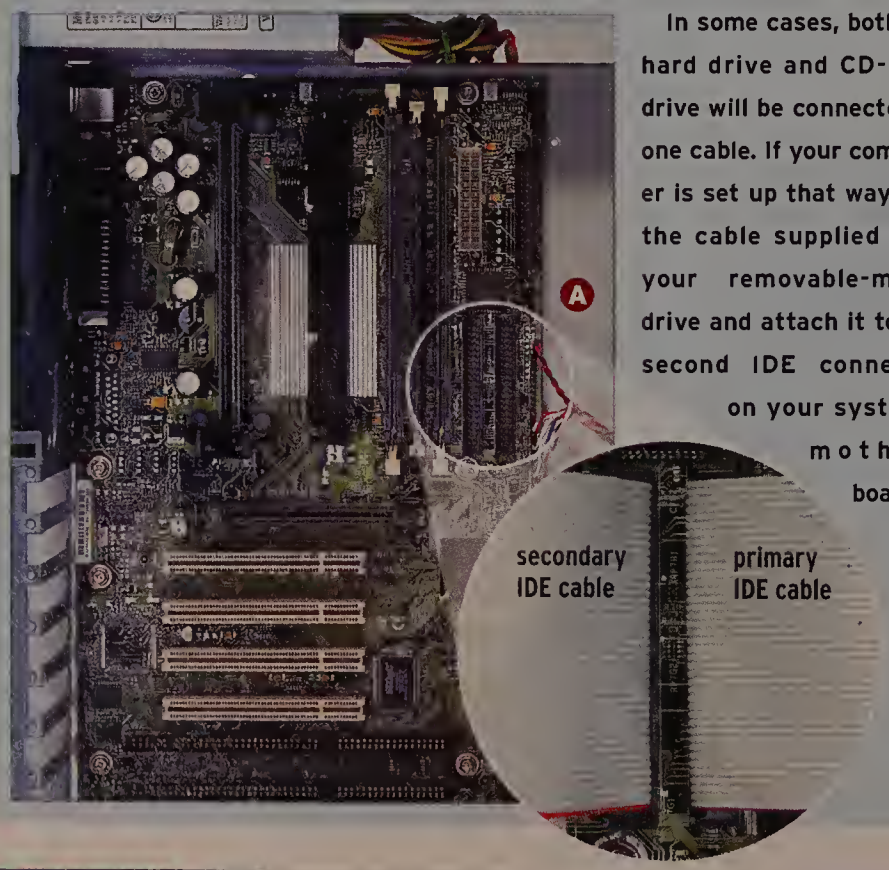
Stan Miastkowski is a contributing editor for PC World. ■

THE TOP DOWN

Benefits: extra drive space, secure storage, portability
Cost: $100 to $200, or $250 to $350 if you need a SCSI card
Time required: 45 to 60 minutes, or 60 to 120 minutes if you install a SCSI card
Tools required: Phillips screwdriver, needle-nose pliers, mounting kit (maybe)
Expertise level: intermediate
Drive vendors: Caleb (www.calebstor.com), Castlewood (www.castlewood.com), Hi-Val (www.hival.com), Imation (www.imation.com), Iomega (www.iomega.com), Sony (www.sony.com/hifd), Winstation (www.winstation.com)
If you need a SCSI card: Adaptec (www.adaptec.com), Iomega (www.iomega.com)

IDE DRIVE

1 Find the connectors. Turn off your PC, unplug it, and remove the cover. There are two IDE connectors (A), the primary and secondary, on your PC's motherboard. Normally, you'll find one with a cable attached to your IDE hard drive and another with a cable attached to your IDE CD-ROM drive. Both cables probably have free connectors. The preferred choice is to use the extra connector on the cable attached to the CD-ROM drive. If no extra connector is available on the cable, replace that cable with the one that came with your removable-media drive.



In some cases, both the hard drive and CD-ROM drive will be connected to one cable. If your computer is set up that way, use the cable supplied with your removable-media drive and attach it to the second IDE connector on your system's motherboard.

2 Set the jumpers. If your removable-media drive is the second drive on a cable, use needle-nose pliers to set its jumpers (B) to "slave." (Most drives come set as slave by default.) If it's the only drive on a cable, set the jumpers to "master."

Note that if you install the removable-media drive on the same cable as your hard drive, you may have to change the jumper settings on your hard drive. Some removable-media drives allot a specific jumper position when they're the only drive with an IDE cable. In that case, you'll have to change the hard drive's jumpers to "master."

PHOTOGRAPHS: KEVIN CANDLAND

SCSI DRIVE

1 Install a SCSI card. If your PC does not have a SCSI card or a built-in SCSI connector, then you'll need to install a SCSI card. Most of today's cards are Plug and Play, but follow the directions in the card's manual. (Iomega's Jaz Jet, shown here, is designed specifically for the Jaz.)

2 Set the SCSI ID number and terminate the drive. SCSI drives must be set for a unique ID number, which is set by jumpers (A) on the drive. If your SCSI removable-media drive is the only SCSI drive in your PC, the default ID (usually 4 or 5) is fine. If you have other SCSI devices in your PC, you'll need to check them to make sure the new drive has a unique ID number.

The devices on each end of a SCSI cable must also be terminated. (If you have no external devices, the SCSI card itself is one end and so must be terminated.) Some drives have jumpers to set the termination, but the Iomega Jaz (shown in next section) doesn't have a termination jumper; instead, it comes with a SCSI cable (B) with its own termination. If you install the Jaz on a different SCSI cable, make sure the Jaz is not the last device.

FOR BOTH DRIVES

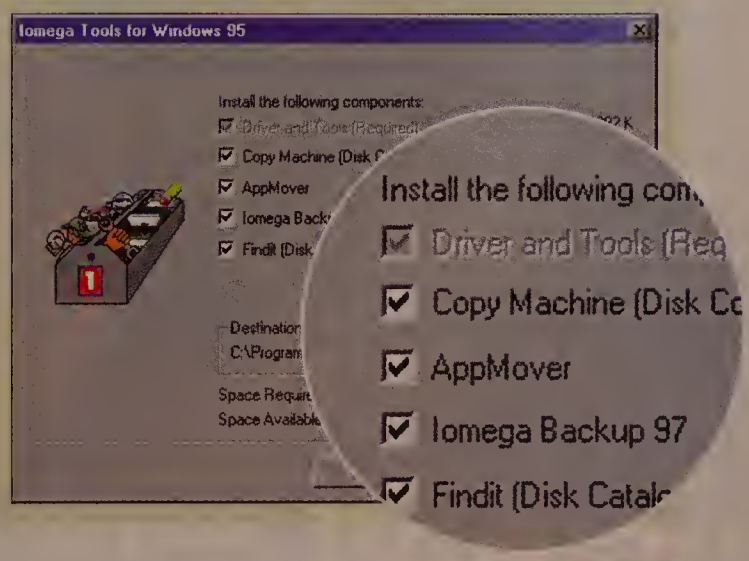
3 Connect the cables and mount the drive. Select a free, externally accessible drive bay. If you pick a 5 ¼-inch bay and you have a 3 ½-inch drive, adapt the drive with a mounting kit.

If you installed a new SCSI card, attach a SCSI data cable to the card's connector (right).

Slide the free end of your data cable through the rear of the bay and connect it to your drive, partially inserting the drive into the bay as needed. Make sure that pin 1 on the data cable (usually marked by a red line on the cable's edge) connects to pin 1 on the drive. As with the data cable, pull a power cable for the drive through and connect it to the drive. Then slide the drive fully into its bay.

4 Install the software. All removable-media drives come with their own driver and utility software. Details vary, so follow the directions that come with your drive.

If you run into problems—say, your PC won't recognize your new drive—turn off the PC and check all connections. If that doesn't solve the problem, call tech support. All removable-media drive makers offer free initial support.



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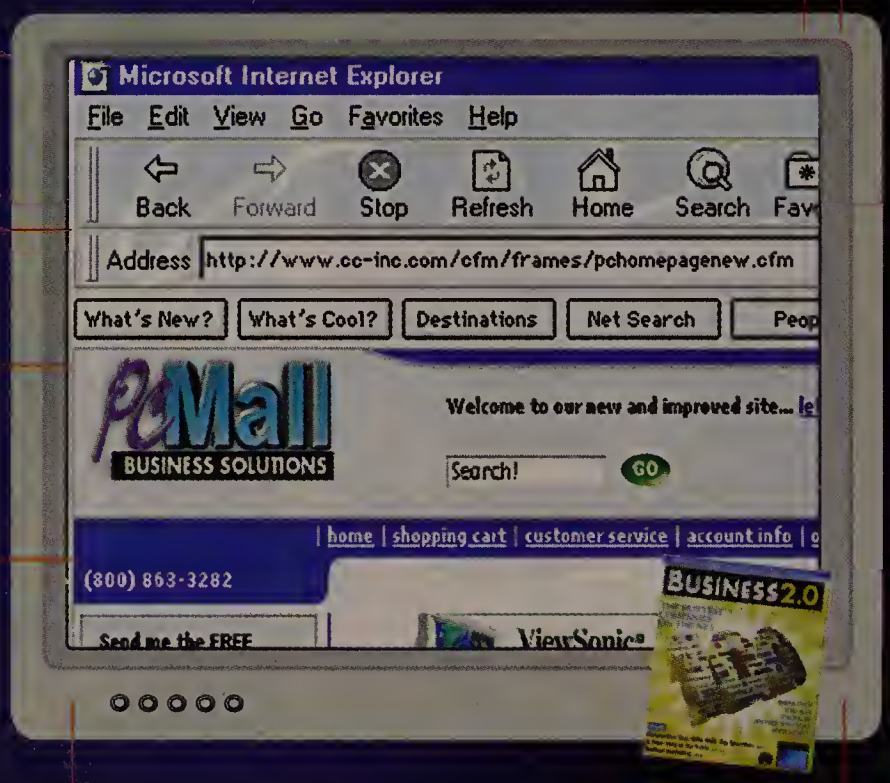

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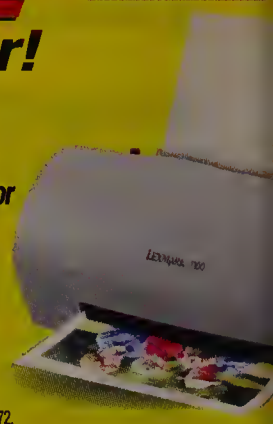

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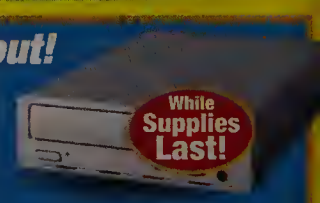

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- DVD ROM Drive
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Order#	Model	Processor	RAM	HD	CD/DVD	Display	Modem	D/S	Price
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#44117	1690	400 AMD-K6-2	64	6.4GB	4X-DVD	14.1" TFT	56K	W98	$2,499

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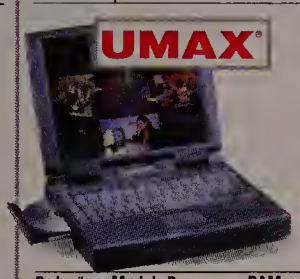

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#47539	8570C	450 PIII MMX	96	19GB	32X	V.90	MT	Win 98	$1,499
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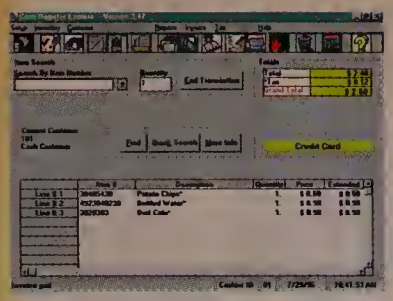

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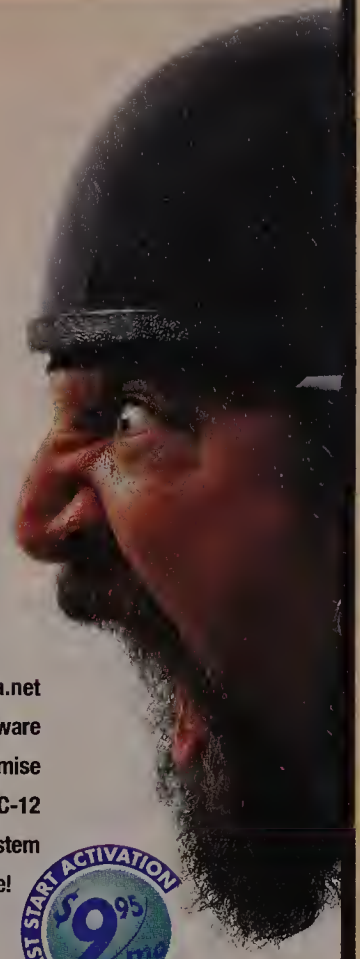

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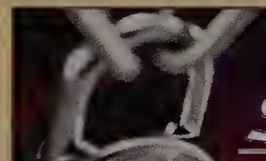

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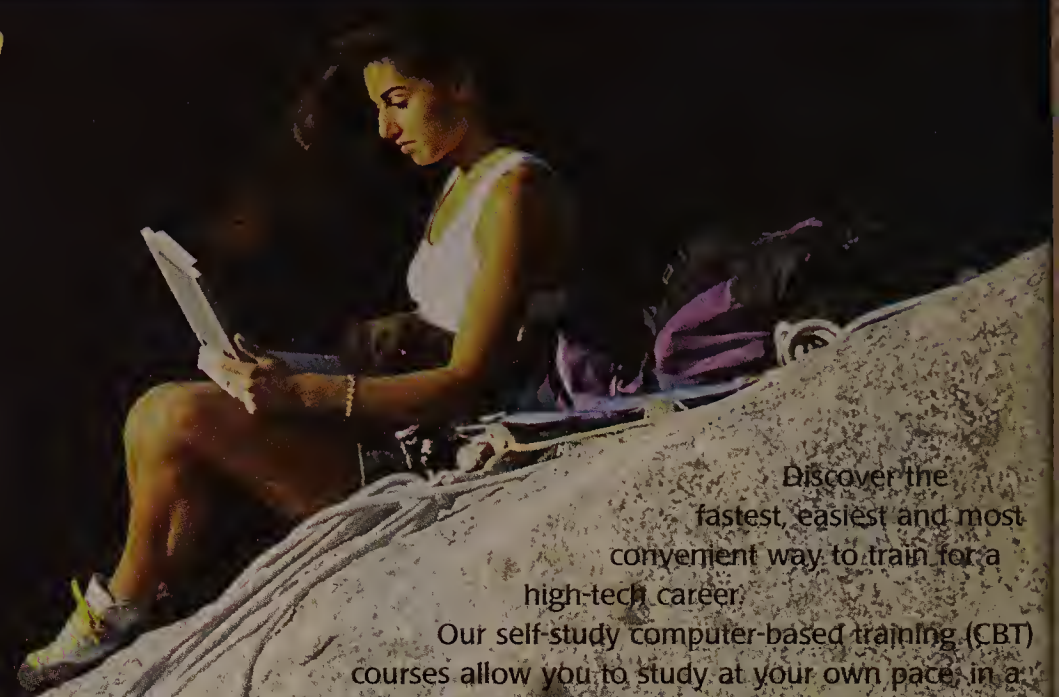

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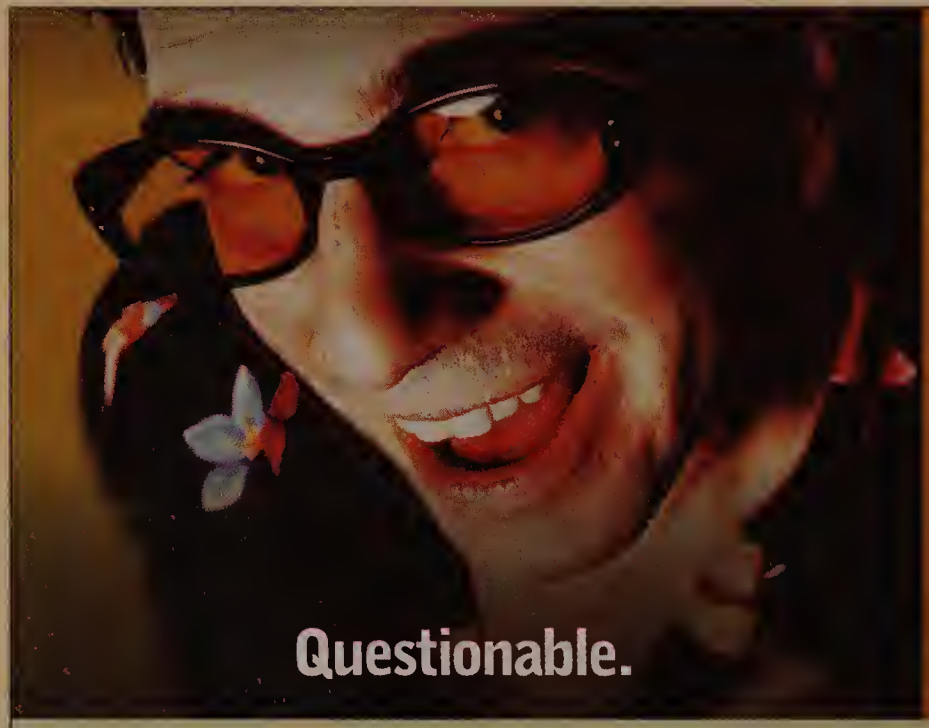

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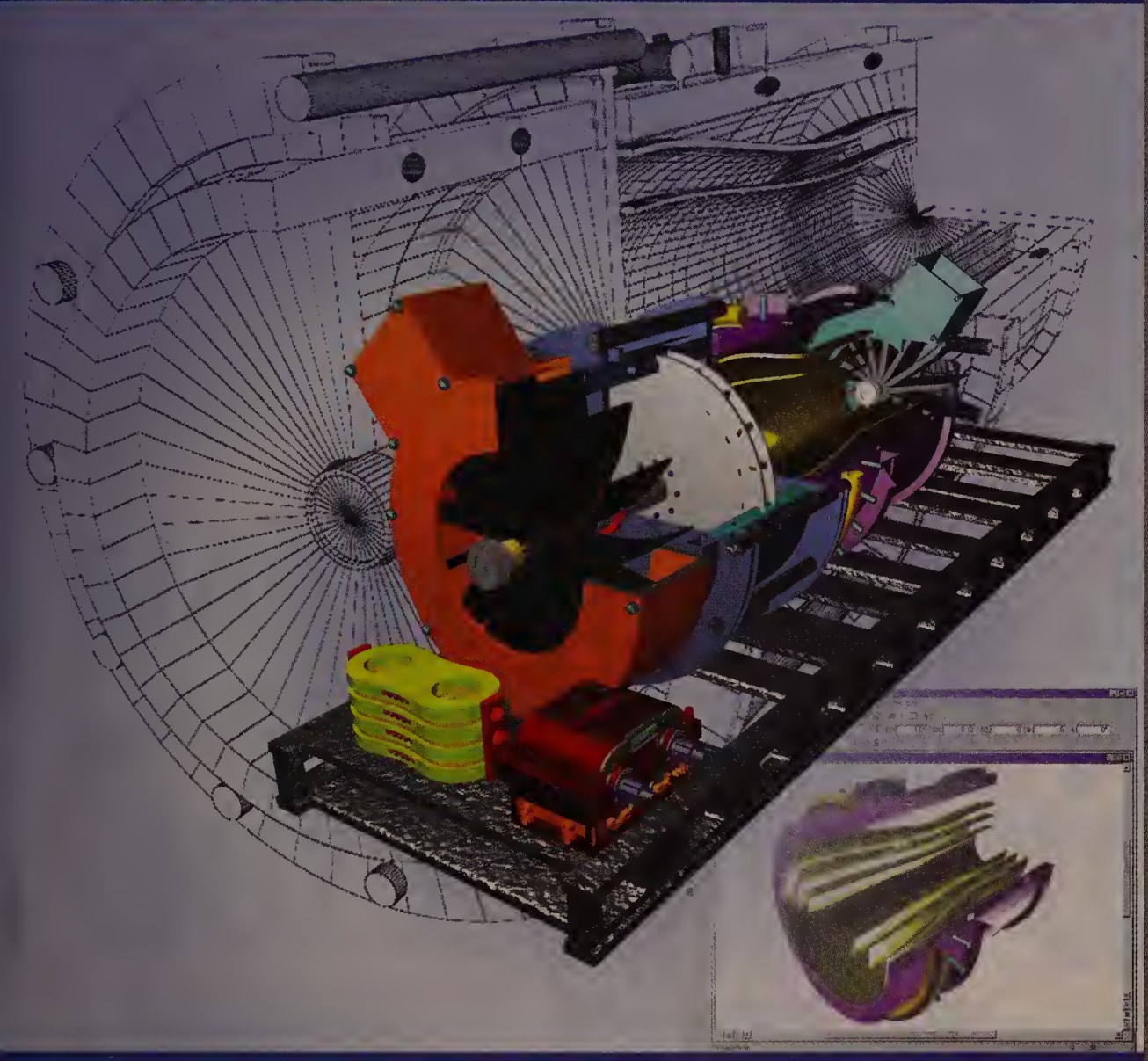

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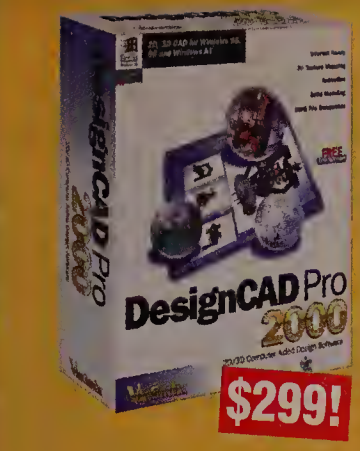

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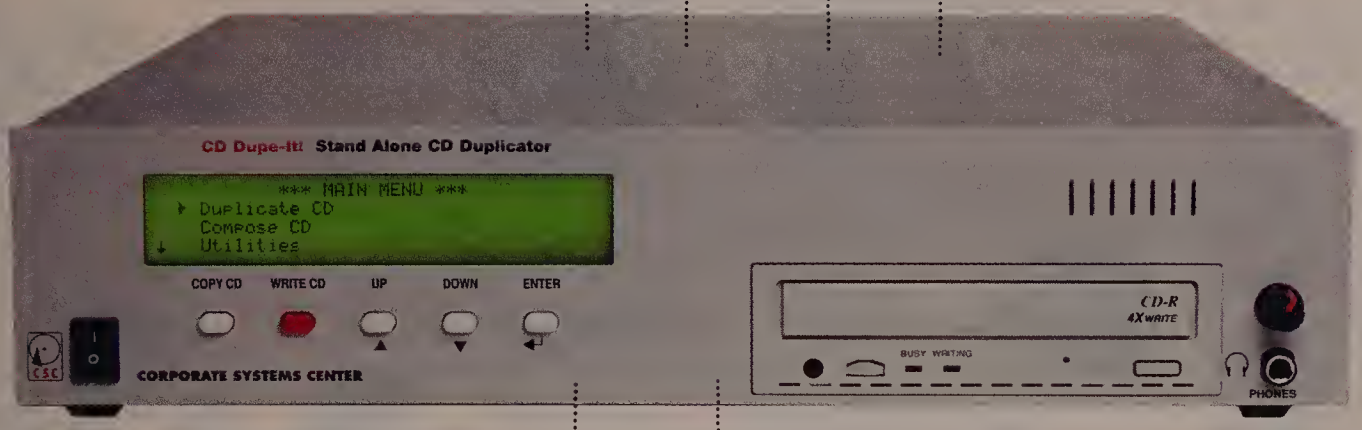

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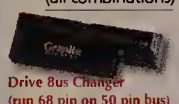

Styles: 68 pin Drive to S0 Bus
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Styles: For Adaptec Ultra Wide Cards
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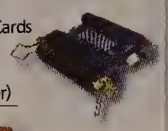

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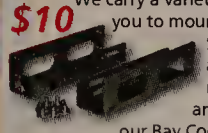

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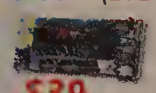

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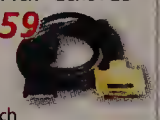

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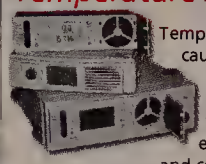

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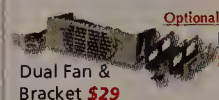

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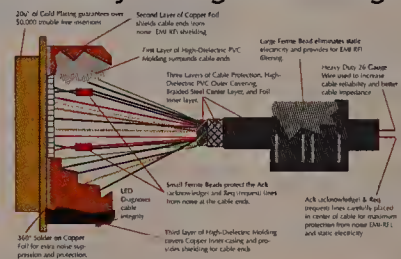

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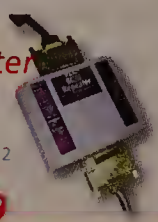

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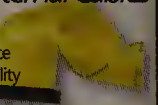
Ultra 2 (LVD) -TPO Internal Cables



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- TPO Shield Improves Signal Quality

Features:
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- Triple Pronged Connector - Gold contacts Silver Wire

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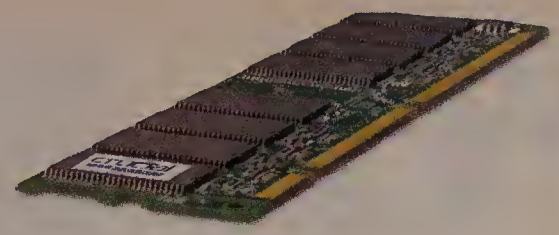

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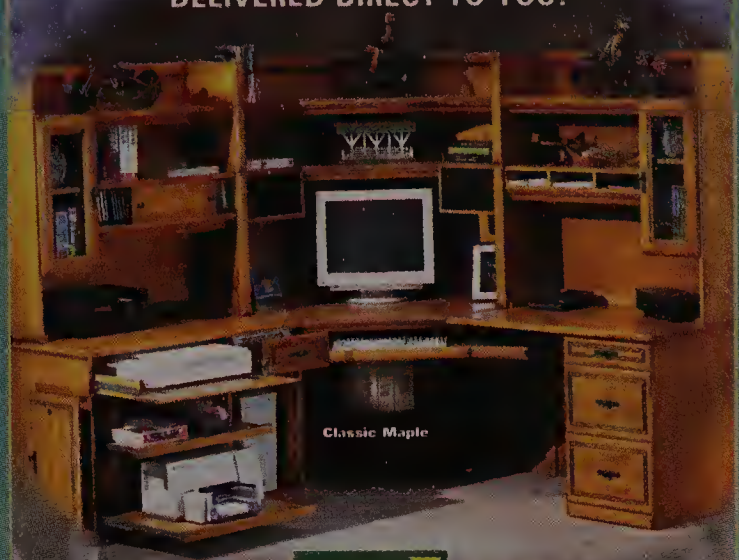

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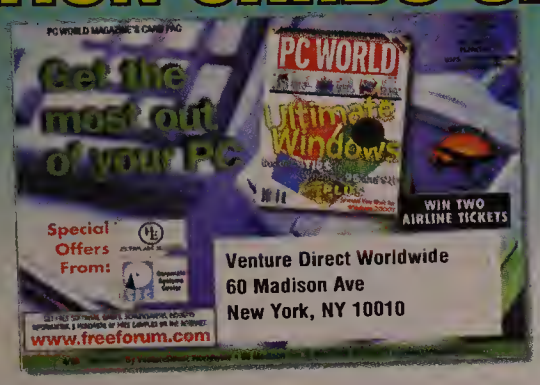

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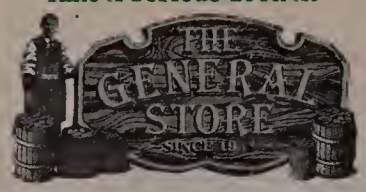

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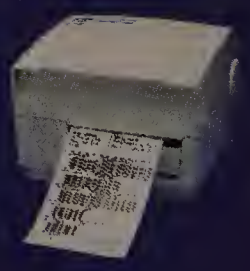

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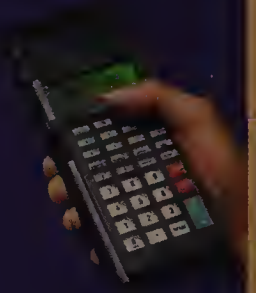

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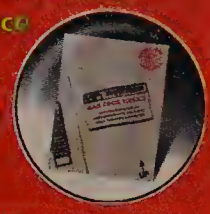

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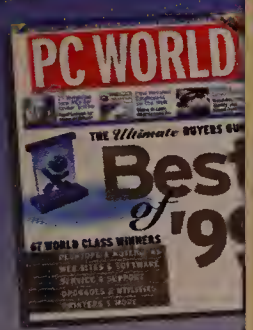

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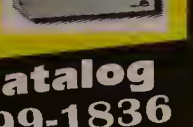

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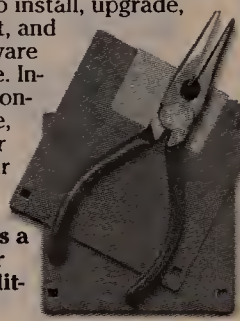

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603	Samsung SyncMaster 530TFT	180
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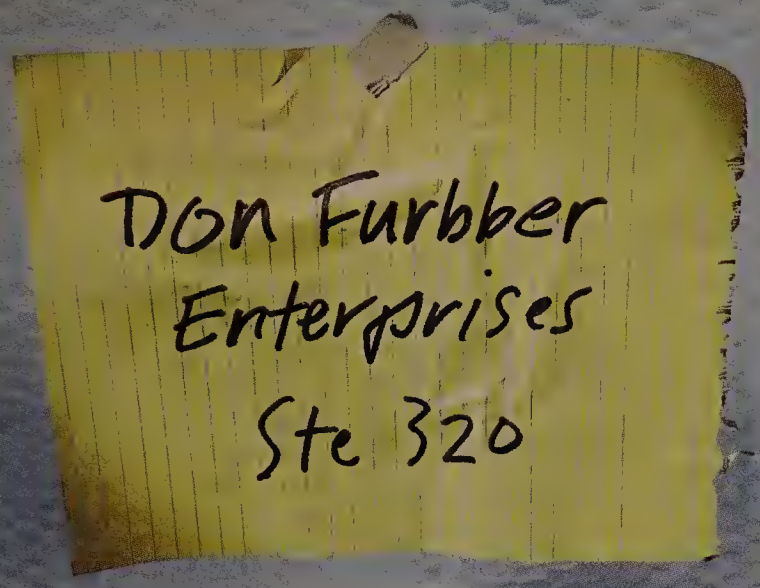

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CTSTM28B	Cyrix MII 300	15"	64MB PC 100	4.3GB UDMA	24X	PCI/4MB	AT/512KB Cache	Windows 98	$18/Month	$599.99
CTSTM40	AMD K6-2/450 3DNow!	15"	64MB PC 100	6.4GB UDMA	32X	AGP/8MB	AT/1MB Cache	Windows 98	$22/Month	$719.99
CTSTM17C	AMD K6-2/350 3DNow!	17"	64MB PC 100	6.4GB UDMA	32X	AGP/8MB	AT/1MB Cache	Windows 98	$23/Month	$759.99
CTSTM35C	AMD K6-2/350 3DNow!	17"	128MB PC 100	10GB UDMA	32X	AGP/8MB	AT/1MB Cache	Windows 98	$25/Month	$829.99
CTSTM37	AMD K6-2/400 3DNow!	17"	128MB PC 100	10GB UDMA	32X	AGP/8MB	ATX/1MB Cache	Windows 98	$26/Month	$869.99
CTSTM12	Pentium II 400MHz	17"	96MB PC 100	10GB UDMA	32X	AGP/8MB	ATX/Slot 1	Windows 98	$29/Month	$959.99
CTSTM29B	Pentium III 450	17"	64MB PC 100	8GB UDMA	32X	AGP/8MB	ATX/Slot 1	Windows 98	$32/Month	$1049.99
CTSTM39	AMD K6-III/400 3DNow!	17"	128MB PC 100	13GB UDMA	40X	AGP/8MB	ATX/1MB Cache	Windows 98	$32/Month	$1049.99
CTSTM47	AMD K6-III/450 3DNow!	17"	128MB PC 100	19GB UDMA	40X	AGP/8MB	ATX/1MB Cache	Windows 98	$34/Month	$1129.99
CTSTM41	Pentium III 500	15"	64MB PC 100	6.4GB UDMA	32X	AGP/8MB	ATX/Slot 1	Windows 98	$36/Month	$1199.99
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CTSTM43	Pentium III 500	17"	128MB PC 100	13GB UDMA	40X	AGP/8MB	ATX/Slot 1/Socket 370	Windows 98	$42/Month	$1379.99
CTSTM45	Pentium III 550	17"	128MB PC 100	19GB UDMA	40X	AGP/8MB	ATX/Slot 1/Socket 370	Windows 98	$51/Month	$1689.99

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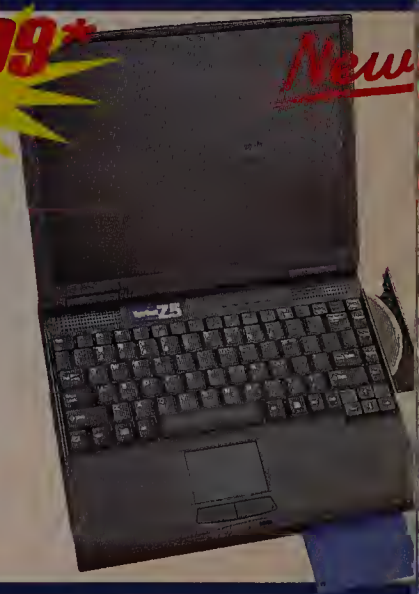

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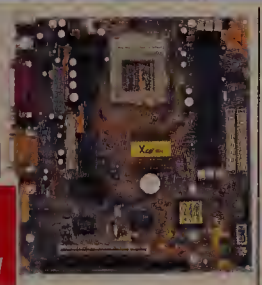
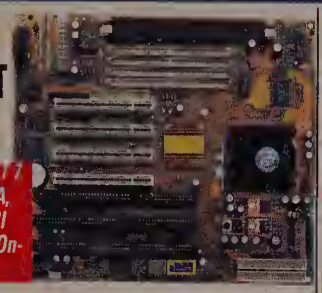


M-741LMRT Micro-ATX SOCKET 370/Slot 1 with Video, Sound, Modem & NIC on-board

ger 741LMRT Form Factor: **M-ATX** • CPU: **Socket 370/Slot** • Bus Speed: **Up to 100MHz** • On-board Video: **AGP** MB • On-board Audio: **Yes** • PCI Slots: **1** • ISA Slots: **1** hared) • Memory: **3 SIMM** • Max Memory: **768 MB**

Tiger M-571 AT Socket 7



M-571—AT SOCKET 7 with 4 PCI/3 ISA, PCI Sound &PCI Video with 4MB On-board

Tiger 571 Form Factor: **AT** • CPU: **Socket 7** • Bus Speed: **Up to 75 MHz** • On-board Video: **PCI 4MB** • On-board Audio: **YES** • PCI Slots: **4** • ISA Slots: **3** • Memory: **2DIMM/4SIMM** • Max Memory: **128/256 MB**

Tiger 599 Micro-ATX Socket 7 with AGP

M-599—ATX Socket 7 with 3 PCI/1 ISA, PCI Sound & AGP Video with 8MB On-board

Tiger 599 Form Factor: **M-ATX** • CPU: **Socket 7** • Bus Speed: **Up to 100MHz** • On-board Video: **AGP 8MB** • On Board Audio: **YES** • PCI Slots: **3** • ISA Slots: **1** • Memory: **3 DIMM** • Max Memory: **768 MB**

iger ATX 763VT Socket 370/ Slot 1

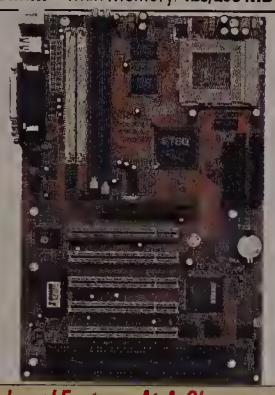
Motherboard ncludes: Motherboard with cable nd manual.

ATX Socket 370/Slot 1 with 1 AGP/4 PCI/2 ISA

iger 763VT Motherboard At-A-Glance

orm Factor: **ATX** • CPU: **Socket 370/Slot 1** Bus Speed: **Up to 100MHz** • On-board Video: **No** On-board Audio: **YES** • PCI Slots: **4** • ISA Slots: **2** Memory: **DIMM** • Max Memory: **768 MB**

Tiger 5EMA+ ATX Super Socket 7

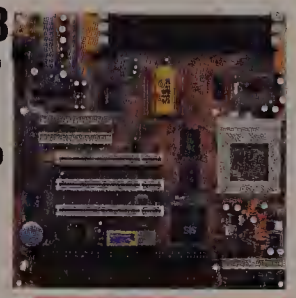


Motherboard Includes: Motherboard with 1MB Cache ; cables, manual

Tiger 5EMA+ Motherboard Features At-A-Glance

Form Factor: **ATX** • CPU: **Socket 7** • Bus Speed: **Up to 100 MHz** • AGP Slots: **1** • PCI Slots: **5** • ISA Slots: **2** • Memory: **3DIMM Sockets** • Max Memory: **768MB**

Tiger 598 AT Super Socket 7 with AGP Video



Motherboards Include: Motherboard, cables & manual

ATX Super Socket 7 with 3 PCI/2 ISA, PCI Sound & AGP Video with 8MB On-board

Tiger 598 Motherboard At-A-Glance

Form Factor: **AT** • CPU: **Super Socket 7** • Bus Speed: **Up to 100 MHz** • On-board Video: **8MB AGP** • On-board Audio: **YES** • PCI Slots: **3** • ISA Slots: **2** • Memory: **3 DIMM** • Max Memory: **768 MB**

MOTHERBOARD SPECIFICATIONS

Motherboard Design	Processors Supported
Tiger 571 AT including Wave Table sound and PCI video	**AMD** Up to K6-300 & K62-266 **Intel** Pentium up to 233 MMX **IBM/Cyrix** Up to PR333
Tiger 598 AT including MB Cache, Wave Table ound and PCI video	**AMD** Up to K6-2/450; K6-III/450 **Intel** Pentium up to 233 MMX **IBM/Cyrix** Up to PR366
Tiger 599 M-ATX including MB Cache, Wave Table ound and PCI video	**AMD** Up to K6-2/450; K6-III/400 **Intel** Pentium up to 233 MMX **IBM/Cyrix** Up to PR366
Tiger 5EMA+ Super Socket 7 MB Cache	**AMD** Up to K6-2/450; K6-III-450 **Intel** Pentium up to 233 MMX **IBM/Cyrix** up to MII 366
Tiger 763VT ATX Slot 1 w/AGP Port	**Celeron** up to 466MHz **Intel** Pentium III up to 500MHz
Tiger 741LMRT ATX Slot 1 w/AGP On-board	**Celeron** up to 466MHz **Intel** Pentium III up to 500MHz

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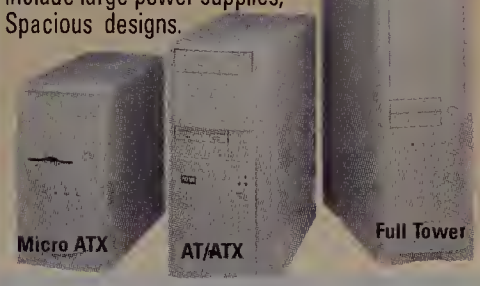

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CA1-C-2B	ATX Case 6-Bay 200-W P/S	$58.99	$54.99	$52.99
CA1-C-4A	ATX Full Tower 9-Bay 300-W P/S	$124.99	$119.99	$115.99

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#CP2-K63-450 450 3DNow!	$239.99	$224.99	$209.99*

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#CP2-P233 Pentium 233 CPU	$46.99	$43.99	$39.99

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*** Celeron CPUs are socket 370 format and require a fan and adapter (see far right) to be used in any slot 1 motherboard.

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#CP2-CI400	Intel Celeron **400** processor***	$106.99	$99.99	$93.99
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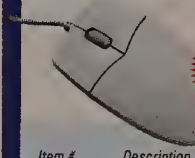

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Note: In order to bring you these low unheard of prices on premium bulk memory, we have negotiated returns for defective exchange only and a 20% restocking charge on all returns with our memory vendor. We will pass these policies on to all retail sales of bulk memory. Call for PNY Branded Memory prices. Prices are subject to change.

Seagate 2.1GB FROM $779.99 HARD DRIVE BLOWOUT!

Item #	Manufacture	Size	Units 1-2	3-5	6+
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THD-3A	Seagate	3.2GB	$84.99	$84.99	$84.99
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†Factory Serviced

Sorry, but as prices are always changing on CPUs and memory, we do not offer price protection in the event prices rise or fall. *Requires 100MHz bus motherboard and 8ns PC100 SDRAM Memory. ** Requires 95MHz bus motherboard and 8ns PC100 SDRAM.. † CD-ROM speeds are variable, maximum speeds are shown. †† Requires 83MHz bus motherboard.Call us for details and warranty information. No returns accepted on CPUs.

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DAQ

The Best Tech Support? None!

THE BIG PROBLEM with tech support is that we need it at all. Imagine having to get technical support for your refrigerator because you "installed" a couple of cartons of milk and a dozen eggs. Or needing support for your TV because you "installed" a new show.

Only computer products come with page after page or screen after screen of troubleshooting tips. Only computer products send you to the phone or the Net in desperate attempts to diagnose problems. Only for computers are there extra-cost add-ons that purport to save brand-new units from catastrophic failure.

The culprit is simple: failure to build and explain products correctly. The industry's basic inattention to quality is why we require technical support in the first place.

Web support consisted of **ten questions,** none of which was, **How** do you make the **damn thing** work?

TECH SUPPORT TANGO

I'VE BEEN TANGLING with tech support a lot lately, and my experiences have not been happy ones. After reading and rereading the installation instructions for an internal CD-Rewritable drive, I had absolutely no idea how to set the jumper that tells the unit whether it's a master or slave. My first try resulted in a boot-up error from the BIOS. So did the second one.

When I called the company—no toll-free number, of course—I had to navigate a phone-mail system and listen to a message extolling the wonders of the company's Web-based support offerings. So, while on hold for a human, I used a different PC to get to the site. Web support amounted to a grand total of ten frequently asked questions, none of which was, How do you make the damn thing work?

Twenty minutes later, a human picked up the phone and asked for my phone number. Then I got the news: "Someone will call you within 48 hours, sir."

"Forty-eight hours? What am I supposed to do in the meantime? And if that's your policy, why don't you just offer an answering machine that does your job?"

"I don't know, sir."

Well, I wasn't about to sit there with a dead machine for two days. I ended up disabling my original CD-ROM drive to get my system to boot up with the CD-RW installed. It worked, but it wasn't exactly what I'd had in mind.

When I tried installing a different company's USB CD-RW drive, nothing worked until I got through to a tech support person, who suggested I disable the obscure "auto insert notification." After that, it worked fine, unless you count the Blue Screen of Death that appeared every time I unplugged the USB cable. Tech support's solution? Leave the cable plugged in.

A SELF-SERVICE AFFAIR

COMPANIES ARE desperately trying to make tech support a self-service affair on the Web, shifting labor costs to the consumer they fail to serve. When there's a specific bug involved, Web sites sometimes work. But most deliver a random collection of help and helplessness.

The hands-down worst support, of course, comes from Internet service providers. In the old days, when my provider was local, a support call would be greeted by an answering machine and a rarely kept promise to call back. Now that the provider's been swallowed by a national company, I get to call Texas. When the line's not busy, I generally get through to someone who tells me the company is aware of the problem but has no idea when it will be fixed.

Calling my cable ISP is even more fun. First I go through a series of phone-mail menus to reach a real person, then I have to give up my account number and mother's maiden name before they'll tell me that, yes, they have heard about a service outage in my state and no, it's not clear how long it will last. I figure someday they'll shift support to the Web. Then when my connection goes down, I won't need to waste time with their lousy support at all.

An able tech support person—and there are some—can certainly ease the pain produced by a recalcitrant machine. But a better idea would be not having to call tech support in the first place. The best support is the simplest: It's the support you never have to use because the product was built with care.

PC World *Contributing Editor Stephen Manes is cohost of* Digital Duo, *a new series on public television stations nationwide. For time and program information, visit www.digitalduo.com.* ■

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Common features: 512KB Integrated L2 Cache (128KB on Intel® Celeron™ Processor-based Systems) ◆ Dell QuietKey® Keyboard ◆ 24-Hour Toll-free Telephone and Online Technical Support ◆ 3-Year Limited Warranty[2] ◆ 1-Year NBD On-Site[3] Service

Common features: Perform Asset Tracking and Remote Diagnostics with Dell OpenManage™ IT Assistant ◆ 3Com® Fast EtherLink™ XL 10/100MB NIC ◆ Long Product Lifecycles for Network Stability ◆ 24-Hour Toll-free Telephone and Online Technical Support

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High Performance, High Value

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- 96MB 100MHz SDRAM
- 6.4GB[4] Ultra ATA Hard Drive
- 17" (16.0" vis, .26dp) M780 Monitor
- 8MB ATI XPERT 98D 3D AGP Graphics
- 40X Max[5] Variable CD-ROM Drive
- Yamaha XG 64V Wavetable Sound
- Microsoft® Office 2000 Small Business plus Bookshelf 2000; McAfee VirusScan
- Microsoft Windows® 98 Second Edition
- MS® IntelliMouse®

$1499

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- Intel Celeron Processor at 400MHz
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- 32MB SDRAM
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- 40X Max[5] Variable CD-ROM Drive
- Intel 10/100 Ethernet Controller
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- 40X Max[5] Variable CD-ROM Drive
- Sound Blaster Pro Compatible Sound
- MS Windows NT® Workstation 4.0
- Dell QuietKey Keyboard
- MS IntelliMouse
- 3-Year NBD On-site[3] Service

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Business Lease[15]: $54/Mo., 36 Mos.

E•VALUE CODE: 03651-390715

DELL OPTIPLEX® G1 400L

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- Intel Celeron Processor at 400MHz
- Tool-Free Opti-Frame Low-Profile Chassis
- 32MB SDRAM
- 4.3GB[4] SMART Ultra ATA Hard Drive
- 15" (13.8" vis) 800F Monitor
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- MS Windows NT Workstation 4.0
- Dell QuietKey Keyboard
- Dell System Mouse
- 3-Year NBD On-site[3] Service

★ *Upgrade to 64MB SDRAM, add $49.*

$999

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- 19" (18.0" vis) P990 Trinitron Monitor
- *NEW* 32MB Diamond Viper 770D nVidia AGP Graphics
- *NEW* 6X Max[10] Variable DVD-ROM Drive and Decoder Card with TV Out
- SoundBlaster Live! Value 512V Sound
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- 3Com USR v.90[11] PCI WinModem
- 250MB Iomega Zip BUILT-IN Drive
- MS IntelliMouse

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Personal Lease[16]: $105/Mo., 36 Mos.

E•VALUE CODE: 03651-500727m

NEW DELL DIMENSION XPS T550 PENTIUM III PROCESSOR AT 550MHz

- 128MB 100MHz SDRAM
- 9.1GB[4] Ultra ATA Hard Drive
- 17" (16.0" vis, .26dp) M780 Monitor
- *NEW* 16MB 3DFX Voodoo3 3000D AGP Graphics Card
- *NEW* 6X Max[10] Variable DVD-ROM Drive
- Yamaha XG 64V Wavetable Sound
- harman/kardon HK-195 Speakers
- *NEW* v.90[11] PCI DataFax Modem
- Logitech MouseMan® Wheel

$1899

Personal Lease[16]: $72/Mo., 36 Mos.

E•VALUE CODE: 03651-500718m

DELL DIMENSION XPS T450 PENTIUM III PROCESSOR AT 450MHz

- 96MB 100MHz SDRAM
- 6.4GB[4] Ultra ATA Hard Drive
- 17" (16.0" vis, .26dp) M780 Monitor
- 8MB ATI XPERT 98D 3D AGP Graphics Card
- 40X Max[5] Variable CD-ROM Drive
- Yamaha XG 64V Wavetable Sound
- harman/kardon HK-195 Speakers
- *NEW* v.90[11] PCI DataFax Modem
- 100MB Iomega Zip BUILT-IN Drive
- MS IntelliMouse

$1399

Personal Lease[16]: $53/Mo., 36 Mos.

E•VALUE CODE: 03651-500713

DELL DIMENSION V400c INTEL CELERON PROCESSOR AT 400MHz

- 32MB SDRAM
- 4.3GB[4] Ultra ATA Hard Drive
- 15" (13.8" vis) 800F Monitor
- ATI 8MB 3D AGP Graphics
- 40X Max[5] Variable CD-ROM Drive
- Yamaha XG 64V Wavetable Sound
- harman/kardon HK-195 Speakers
- *NEW* v.90[11] PCI DataFax Modem
- Logitech First Mouse+ Wheel (PS/2v)

★ ***Dell Customized Upgrade, add $159.*** *64MB SDRAM, 6.4GB[4] Hard Drive, 17" (16.0" vis, .26dp) M780 Monitor (E•Value Code: 03651-500710)*

$899

Personal Lease[16]: $35/Mo., 36 Mos.[17]

E•VALUE CODE: 03651-500708

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- Works Calendar
- Graphics Studio Greetings
- Expedia Streets 98

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- Excel 2000
- Publisher 2000
- Outlook 2000
- Small Business Tools

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- PowerPoint 2000
- Access 2000
- Microsoft Office Assistant

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- 128MB 100MHz ECC SDRAM
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Business Lease[15]: $147/Mo., 36 Mos.

E•VALUE CODE: 03651-290743

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- Integrated PCI Ultra-2/LVD SCSI Controller
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Business Lease[15]: $120/Mo., 36 Mos.

E•VALUE CODE: 03651-890735

DELL INSPIRON 7000

Desktop Features, Notebook Convenience
- Intel Celeron Processor at 366MHz
- 15" XGA Active Matrix Display
- 32MB SDRAM
- 4.8GB[4] Ultra ATA Hard Drive
- Removable Combo 24X Max[7] Variable CD-ROM and Floppy Drive
- 2X AGP 4MB ATI RAGE LT Pro 3D Video
- Microsoft Works Suite 99 with Money 99 Basic
- MS Windows 98 Second Edition

$1999

Business Lease[15]: $67/Mo., 36 Mos.

E•VALUE CODE: 03651-890719

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Network-Optimized Notebook
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- 14.1" XGA Active Matrix Display
- 64MB SDRAM (512MB Max[13])
- 4.8GB[4] Ultra ATA Hard Drive
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- 1-Year Next-Business-Day On-site[3] Service
- ★ *Upgrade to 96MB SDRAM, add $99.*

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Business Lease[15]: $64/Mo., 36 Mos.

E•VALUE CODE: 03651-790718

DELL INSPIRON 3500

Light Weight, Light Price
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- 14.1" XGA Active Matrix Display
- 32MB SDRAM
- 4.8GB[4] Ultra ATA Hard Drive
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- NeoMagic MediaMagic 256AV AGP Video
- Microsoft Works Suite 99 with Money 99 Basic
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Business Lease[15]: $60/Mo., 36 Mos.

E•VALUE CODE: 03651-890717

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- 2X AGP 4MB ATI RAGE™ LT Pro 3D Video
- 3D Surround Sound with Wavetable
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- 6.4GB[4] Ultra ATA Hard Drive
- 17" (16.0" viewable, .26dp) M780 Monitor
- 8MB ATI XPERT 98D 3D AGP Graphics Card
- 40X Max[5] Variable CD-ROM Drive
- Yamaha XG 64V Wavetable Sound
- harman/kardon HK-195 Speakers
- V.90[11] PCI DataFax Modem
- 100MB Iomega Zip BUILT-IN Drive
- Microsoft® Office 2000 Small Business plus Bookshelf 2000; McAfee VirusScan
- Microsoft Windows® 98 Second Edition
- Dell QuietKey® Keyboard
- MS® IntelliMouse®
- 3-Year Limited Warranty[2]
- 1-Year Next-Business-Day On-site[3] Service

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